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Monika Bachur

Forschungszentrum Ozeanränder, RCOM

Universität Bremen

Postfach 330 440

D 28334 BREMEN

Phone: (49) 421 218-65516

Fax: (49) 421 218-65515

e-mail: MBachur@uni-bremen.de

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Table of Contents

1. Participants

Name	Dicipline	Institution
Bender, Vera	Sedimentology	GeoB
Bujan, Stephane	Sedimentology	EPOC/DGO
Elvert, Marcus (*)	Organic Geochemistry	RCOM
Frederichs, Thomas W.	Geophysics	GeoB/RCOM
Hanebuth, Till J.J., Chief Scientist	Sedimentology	GeoB/RCOM
Kockisch, Brit	Sedimentology	GeoB
Krastel-Gudegast, Sebastian	Seismics	GeoB/RCOM
Lantzsch, Hendrik	Sedimentology	RCOM
Mena Rodríguez, Ángel	Sedimentology	Uni Vigo
Schmidt, Frauke	Organic Geochemistry	RCOM
Strozyk, Frank	Modelling	RCOM
Wagner-Friedrichs, Michelle	Seismics	GeoB

RCOM Research Center Ocean Margins, Universität Bremen
Leobener Straße, D 28359 Bremen, Germany

GeoB Fachbereich Geowissenschaften, Universität Bremen
Klagenfurter Straße, D 28359 Bremen, Germany

EPOC Environnements et Paléoenvironnements Océaniques, UMR 5805 CNRS
Université Bordeaux I, avenue des Facultés, 33405 Talence cedex, Fr.

DGO Département Géologie et Océanographie, Université de Bordeaux I, Avenue des Facultés, 33405 Talence Cedex, France

Uni Vigo Departemento de Xeociencias Mariñas e Ordenación do Territorio, Universidade de Vigo, 36310 Vigo, Spain

(*) M. Elvert has leaded the pre-cruise onshore sampling trip without participating in the subsequent cruise.

2. Summary of the research cruise P-342

GALIOMAR (Galicia *Ocean Margin* Expedition)

DISTRIBUTION PATTERN, RESIDENCE TIMES AND EXPORT OF SEDIMENTS ON THE PLEISTOCENE/HOLOCENE GALICIAN SHELF (NW IBERIAN PENINSULA)

Continental shelves are complex and individual sedimentary systems. The understanding of their evolution and their role in sediment filtering, storage and release is of major importance since all land-derived sediments have essentially to cross the continental shelf zone as part of the global sedimentary cycle. The cruise P-342 GALIOMAR to the NW-Iberian shelf was performed to supply an existing RCOM-project with scientific material.

Shallow-acoustic profiling shows surficial mud-belt deposits along the inner shelf and abundant surficial sediment sheets, lenses, patches on its outer parts. These young deposits are separated from each other either by rocky outcrops or by areas of non-deposition, although the outcrops also often cause sediment trapping. Internal stratification of these young depocenters suggests a multi-story depositional history, an observation which is corroborated by the fact that these depocenters do not fully correspond to seafloor mapping of modern mud distribution pattern. Deeper-penetration seismic profiling has elucidated the interplay of massive sediment accumulation units due to high terrigenous sediment supply and tectonic activity plus erosion over longer time periods.

Due to perfect weather condition over major parts of the cruise, we obtained 43 spectacular sediment cores in dense coverage of the study area. This success was made possible by the utilization of a 5-m vibrocorer with a 200-m long electrical cable and by a core-location selection strategy on the basis of Boomer profiles. The retrieved sediment cores show a highly variable inventory of sedimentary facies. Mentioned as some examples, homogeneous mud is related to local depocenters along current-driven sediment pathways. Well-sorted shell gravel horizons indicate the wide occurrence of paleo-coastal remnants, whilst abundant distinct beds of chaotic texture have probably been formed by frequent storm events. These findings evidence a complex depositional shelf history with strong influences through forcing sea-level changes, persistent oceanographic material separation processes and intensive storm modification.

Sedimentological, (organo-) geochemical and geophysical analyses together with a robust stratigraphic control will lead to a reconstruction of the sedimentary history which then will be used to focus on the transport and deposition pattern of individual sediment components.

3. Scientific Motivation and Background

3.1 Introduction

The research project C6 "*Sediment partitioning and transformation on the shelf*" as part of the *Research Center Ocean Margins* (RCOM) of the German Research Foundation (DFG) focuses on sedimentary processes in shelf systems with a multi-disciplinary approach. Main objectives are i) the separation of different material-component groups along the sediment pathways, and ii) the individual temporary or long-lasting residence times of these groups.

The modern oceanographic and sedimentary systems of the Galician shelf are well understood, which is mainly the benefit of the European OMEX program. The Pleistocene/Holocene history of this shelf is, however, almost unknown yet. The aim of this cruise was i) to elucidate the sedimentary transport and partitioning pattern, ii) to define the component-specific filter effects, iii) to investigate the transformation of material groups with regard to their individual residence times in the shelf system, and iv) to understand the influence of framing factors, such as sea-level variations, climatic and oceanographic changes, on the sedimentary system. As well, the continental slope as the final material sink should was included.

3.2 Program of the RCOM Project C6

3.2.1 Scientific targets

By fractionating and delaying the transport of sediments on its unidirectional source-to-sink traveling, shelves create complex sediment flow pattern. The interplay of several factors controls sediment transport, distribution and deposition. Of these factors, composition of the terrigenous material, quantity of sediment input, local shelf physiography, and oceanic current conditions are most important. On geologic time scales, however, climate variability and sea-level changes are predominant forces. Biogenic and clastic materials delivered from land pass a series of depositional zones on the shelf. Several processes like current sorting, selective deposition, bypassing, winnowing, and remobilization modify the sediment composition on its transit. As one result, the contrast of multi-story condensation (palimpsest) versus centers of high accumulation appears in local differentiation. Furthermore, the residence time of sediments on their way from the coastal zone towards the shelf break, the ultimate drain for

shelf material, is controlled by these complex interactions of preconditions (factors) and processes.

Isolated sedimentary structures/bodies represent modern and ancient local depocentres on the shelf and provide continuous sedimentary records over certain (usually short-lasting but high-resolution) time intervals. As well, they document characteristic environmental shifts through time, e.g. as response to sea-level changes. Moreover, zones and local places of non-deposition indicate bypassing/erosion and provide a tool for stratigraphic correlation. The sediment characteristics express type and changes of sediment shelf sources (primary/redistribution) and sedimentary processes (transport/deposition). Different fractions of organic matter provide information on material distribution patterns leading to individual residence times with regard to grain size and duration of exposure. Accumulation rates of individual terrigenous and marine fractions and their lateral and temporal changes yield for semi-quantitative sediment budgeting. These calculations together with stratigraphy/facies models will be incorporated in a finite difference model for quantifications with regard to sediment types and morphology. In the end, the different shelf systems will be translated into generalized sedimentary facies models.

3.2.2 Basic questions

1) What factors and processes govern sediment transit patterns across the shelf with impact for the partitioning of sediments?

First, we need to identify how material partitioning takes place which is directed by shelf-internal forces: What processes determine general and selective sediment transport pathways across the shelf? What is the impact of type and volume of sediment input, transport, (re)distribution, (re)deposition, (re)mobilization and export, respectively, for the physical partitioning of sediment? Are different fractions, e.g., siliciclastic/carbonate/organic fractions, affected differently? How efficient is the fractionation process? What information on sedimentary processes can be extracted from ^{14}C ages of the various carbon pools (terrestrial/marine OM, foraminifers, bulk organic matter) in a range of different shelf zones? Can age differences of these carbon pools be used to constrain and model sedimentation pattern on the shelf? What significance do locally restricted physiographic configurations have on sediment transport pathways? What mechanisms and configurations control the sediment export towards and beyond the shelf break?

2) How effective are the 'filter effects' in the shelf system?

Then as a following step, we look at the time component delaying the sediment transit selectively to elaborate how the shelf filter imprints material characteristics in detail: What are the residence times of different kinds of material in shelf systems? What conditions are responsible for permanent or temporary storage, or bypassing of material? How reliable is the filter? Can we conceive models of long-term burial of carbon on the shelf and thus its role in the geologic carbon cycle? Is a (semi-)quantitative budgeting of sediment transport and deposition possible (by combining seismic and sediment analysis with modeling)? How did the sediment flux change through time and how has it been altered, if at all, by diagenetic processes?

3) What is the impact of different delay time for material transformation?

The idea is that local deposits bear a record of individual material groups that rest on in their position and change their chemical signature with time: What is the importance of mobilisation, sedimentation processes and storage time, respectively, for the chemical transformation of sediment components? What information can be extracted from 14C ages of the various carbon pools? Can OM in shelf sediments, which have accumulated rapidly and often undergone re-suspension and diagenesis, be distinguished from nearby slope sediments?

4) How do the sedimentary processes on the shelf respond to varying shelf configura-tions with regard to short-living changes?

This final part deals with the time-component, i.e., super-ordinate frame conditions and their changes with impact on the individual features summing-up the sedimentary shelf system and on the system as a whole. It combines the answers on questions 1) to 3) and transfers the find-ings on sediments from various time-slices of the glacial-interglacial shelf and shelf break evolution: What is the effect of changing frame conditions, e.g., sediment input due to run-off/vegetation, shelf geometry and sea level, oceanographic pattern, on both controlling base-level and accommodation space? How does the sedimentary pattern change at the interface shelf/upper continental slope through time?

3.2.3 Methods

Sedimentology

Radiography, grain-size analysis (Sonic Sifter, Sedigraph/Laser particle sizer), end-member modelling, XRD-scanner, sand/silt component analysis, clay mineralogy, TOC/carbonate (Leco), 14C-dating; provenance analysis, ecosystem analysis, correlation, facies analysis, sequence-stratigraphy.

Organic Geochemistry

Accelerated microwave extraction, liquid chromatography, preparative high performance liq-uid chromatography (HPLC), 14C-dating, HPLC-mass spectrometry (HPLC-MS), gas chromatography (GC), GC-mass spectrometry (GC-MS), GC-isotope ratio mass spectrometry (GC-IRMS).

Sedimentacoustic/Seismics

Hydroacoustics (Sediment echo sounder/swath bathymetry), high-resolution multi-channel seismics, sediment physics, Sidescan Sonar.

Sediment Physics

On board: magnetic susceptibility and porosity (multi sensor core logger), photo scanner.
In the lab: alternating field demagnetization & generation of different synthetic remanent magnetization (automated cryogenic rock magnetometer), magnetic properties measurement system for temperature and field dependent experiments.

3.2.4 Research Progress

The progress of this project can be seen on the following internet address:
http://www.rcom.marum.de/Project_C6.html

3.3 Strategy of the RCOM Cruise P-342

To fulfill the targets of the above introduced RCOM-project, we have selected the Minho-Galician (NW Iberian) shelf for our studies. This area is well-suited for the intensions due to several reasons.

1. The point sources delivering terrigenous material are defined, as main contributors the Douro and Minho rivers, and their discharge in terms of sediment quality and quantity is known (e.g., Araújo et al., 2002);
2. Modern oceanographic system and sedimentary pattern are documented in detail (OMEX II; van Weering et al., 2002, and articles therein) providing detailed modern-analogue reference data sets;
3. Confined river and coastline systems seem to have left erosional and accretionary remnants (Dias et al., 2002) but almost no detailed downcore studies have been made yet (Martin et al 2005);
4. Slope data document the pre-Holocene history and provide a linkage to the shelf sedimentary history (ENAM I; Mienert et al., 1998, and articles therein; Baas et al., 1997);
5. This area represents one of the northernmost European shelves which was not covered by ice during glacial times;
6. But: the development of the former system, i.e. in the latest Pleistocene to Holocene time interval, is more or less unknown except for some studies from the mid-shelf mud belt.

The research area is bordered by the mouth of the Douro River as the main sediment supplier in the south and the region around Cap Finisterre in the North as the assumed area of ultimate sediment export. The eastern boundary is defined by the innermost shallow-waters close to the coast and the basinward limit is represented by the lower continental slope as the potential final sediment sink. The extension of the research area is consequently framed by the coordinates 43°30' N 10°00' W and 41°30' N 8°00'W.

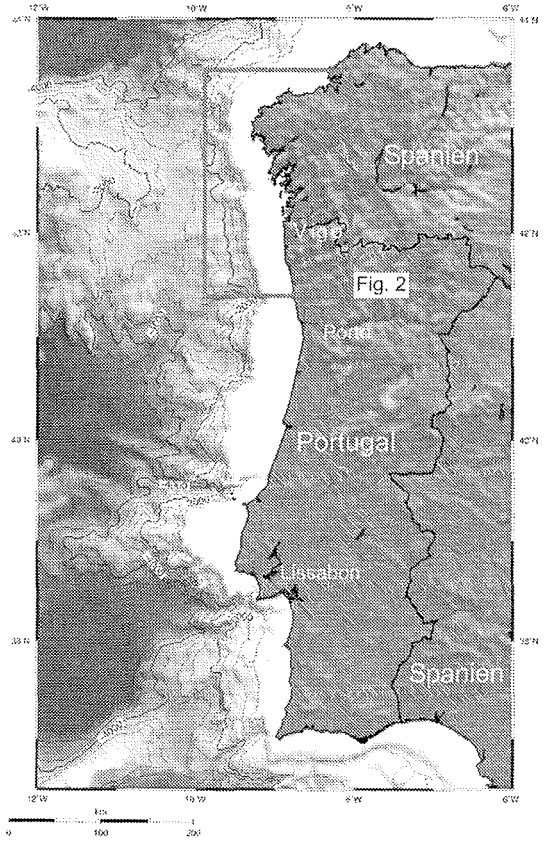


Fig. 3.3.1: Study area of research cruise P-342.

To receive the highest-quality data and material, the overall cruise strategy required a stepwise communication of sediment-acoustic and seismic profiling on the one hand, and sediment coring with instruments proved for sand-drilling on the other. Due to the typical local lateral variability of sedimentary facies and small-scaled sedimentary depocenters the core locations could only be selected on the base of sediment-acoustic results. As overall strategy, we planned to start with an overview survey as initial data base. Then, detailed succeeding profiling has provided insight into the local subbottom and deeper structures. Especially the boomer profiling should then serve for the selection of core stations with the preference i) to cover the expected high variability of sedimentary facies types as complete as possible, and ii) to install a dense grid of cores to be able to trace the sediment pathway in suited lateral and temporal resolution.

The close combination of different geoscientific disciplines – Sedimentology, Sediment-acoustics/Seismics, Geochemistry, Organic Geochemistry, and Geophysics – provides a modern and powerful approach to obtain answers on the main scientific questions.

4. Preliminary Results

4.1 Pre-Cruise Onshore Sampling Trip

(M. Elvert, F. Schmidt)

4.1.1 Introduction

Two major and several smaller rivers drain into the Galician shelf system and deliver sediment load. The two main sources of terrestrial material to the Galician shelf are the Douro River in the southern region and the Minho River in the northern part of Galicia (e.g. Dias et al. 2002). For a clear characterization of the terrestrial material, particularly for the geochemical analysis of organic matter, the rivers were sampled. Sampling locations were selected close to the estuary to receive realistic information of the sediment input. Some of the sampling locations were affected by infiltration of seawater as a result of reduced fresh water discharge during summer. In the case of high salinity content at a given sampling site, an additional station further inland was chosen to avoid masking of terrestrial compounds by marine organic matter. In general, the surrounding area of the rivers near the estuary is characterized by rank vegetation (Fig. 4.a). The climate zone in the working area changes from humid sea climate in the North (Rìas Baixas, Minho) to less humid, winter rain climate in the South (Douro). The hinterland of the Minho is completely dominated by dense woodland of temperate humid climate. The Douro on the other hand, before entering the humid climate zone, passes the semi-arid plains of central Spain.

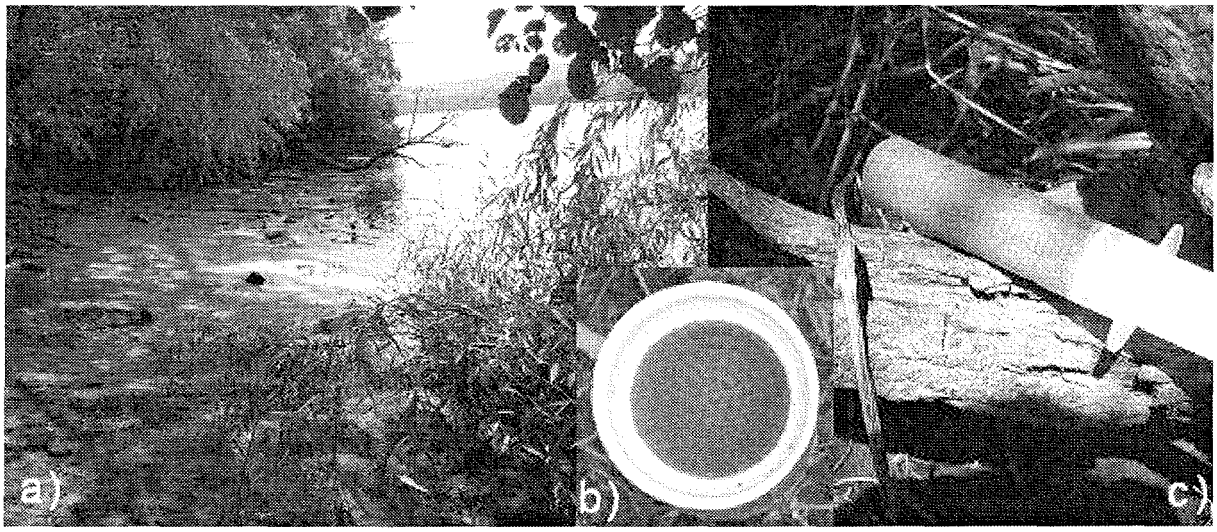


Fig. 4.1.1: a) Vegetation in the surrounding area of the Minho River (Station 3).
b) POC in GF/F- filter after filtration of 1.5 L river water (Station 9, Lima River).
c) Mini-sediment core (Station 1, Minho River).

The main river discharge of the Douro is held back by several dams, with the final one located in 20 km distance close to the estuary. To record the effects of these water reservoirs on the biomarker distribution one such station (Station 4) was sampled which will be compared to a station (Station 5) right below the dam. The third station in this sequence (Station 6) was close to the estuary where a clear marine impact was observed. All characterizations of the sampling sites are shown in Tab. 4.1

Tab. 4.1: Characterization of onshore sampling locations.

Sampling site	Latitude	Longitude	Characterization
Station 1 Minho river 1 km SE' As Eiras north bank	41°55'30.55"N	8°46'39.27"W	distance to coast: 11 km vegetation: rank (grass, ivy, several types of trees) sediment: muddy sand, brownish grey colour (oxic/anoxic boundary in 3 cm depth) water: near the riverbank muddy, slightly saline
Station 2 Minho river 0.7 km N' Cortes, 1.5 km W' Bridge to San Salvaterra south bank	42°04'37.60"N	8°31'03.90"W	distance to coast: 42 km vegetation: rank (grass, several types of trees) sediment: bottom load and coarser sand water: no salinity, fresh water bivalves, algae-rich
Station 3 Minho river 1.5 km N' Ganfei south bank	42°03'06.48"N	8°31'03.90"W	distance to coast: 35 km vegetation: rank (grass, several types of trees) sediment: fine sand, anoxic below 5 cm depth water: laminar flow, no salinity, fresh water bivalvae, algae
Station 4 Douro river reservoir near Crestuma north bank	41°04'32.42"N	8°28'52.69"W	distance to coast: 21 km vegetation: rank (grass, climbers, several types of trees) sediment: artificial bank, no sediments water: stagnant water, no salinity
Station 5 Douro river 1 km W' Crestuma downriver of the dam north bank	41°04'19.12"N	8°30'25.47"W	distance to coast: 19 km vegetation: rank (grass, several types of trees) sediment: middle sand, schist (bedrock) water: slightly saline wide riverbed
Station 6 Douro river 2 km W' Jovim north bank	41°06'45.07"N	8°32'18.03"W	distance to coast: 13 km vegetation: grass, several types of trees, reed sediment: middle sand water: slightly saline wide riverbed
Station 7 Ave river near Ponte D'Zamairo north bank	41°21'06.03"N	8°40'53.76"W	distance to coast: 7,5 km vegetation: grass, several types of trees sediment: soil water: swampy, algae-rich

Station 8 Cavado river 1.5 km W' Gemezes north bank	41°31'00.39"N	8°44'38.30"W	distance to coast: 6 km vegetation: grass, several types of trees sediment: muddy sediment water: slightly saline, high concentration of fine POC
Station 9 Lima river 0.5 km S' Torre north bank	41°42'41.68"N	8°42'53.40"W	distance to coast: 11 km Vegetation: grass, several types of trees sediment: coarser grained sand water: slightly saline, high concentration of fine POC river bed wide + branched
Station 10 Ulla river 3 km W' Barcala ca. 0.8 km E' highway Vigo-Santiago	42°43'55.07"N	8°37'33.82"W	distance to coast: 16 km vegetation: rank (grass, several types of trees) sediment: stony, sheltered locations with mica-rich fine sand water: no salinity, clear water, relatively fast flowing location was badly affected by forest fire
Station 11 Ulla river 1 km in the north of Vilar south bank	42°42'23.58"N	8°42'20.63"W	distance to coast: 9 km vegetation: reed sediment: middle to coarse grained sandy beaches & smooth rocks water: relatively high salinity
Station 12 Ria de Vigo Ponte Sempaio	42°20'54.72"N	8°42'23.63"W	distance to coast: - km vegetation: grass, several types of trees sediment: tidal flat, muddy sediment, eelgrass, mussels water: seawater
Station 13 Verdugo river Taboadelo, near sewage work north bank	42°20'38.19"N	8°34'28.14"W	distance to coast: 4 km vegetation: (grass, several types of trees) affected by forest fires sediment: rocky river bed water: saline
Station 14 Verdugo river 1 km S' Taboadelo near old + new bridge north bank	42°20'36.96"N	8°34'08.41"W	distance to coast: 4.5 km vegetation: (grass, several types of trees) affected by forest fires sediment: rocky river bed water: slightly saline

4.1.2 Water and Sediment Collection

At each station 2 – 3 L of river water were filtrated through GF/F filters (pore size of 0.7 µm) to sample the particulate organic matter (POM) (Fig. 4.b). 50 ml of the filtrated water were retained for biomarker analysis of dissolved organic matter (DOM). Sediment samples of the surface were taken most of the time at the riverbank for biomarker and sedimentological analyses (Fig. 4.c). The DOM and sedimentology samples were stored at +4 °C in the dark, the sediment samples and POC filters at -20 °C in the dark. All samples are listed in Tab. 4.2.

Biomarker samples (sediments and POM) will be analyzed qualitatively and quantitatively by GC-FID (gas chromatography-flame ionization detection) and GC-MS (gas chromatography-mass spectrometry) as well as by GC-IRMS (gas chromatography isotope ratio mass spectrometry) for their isotopic compositions. DOM samples will be analyzed via ultrahigh-resolution MS (FT-ICR-MS = Fourier transform ion cyclotron resonance mass spectrometry) for detailed compositional information of organic matter. For more details of the analytical techniques see Chapter 4.5.1.

Tab. 4.2: Sampling list Galician rivers.

Sampling site	Date	Sample	Sampling location / sediment depth
Station 1	15.08.2006	POM (2 L)	riverbank
		DOM	riverbank
		POM (2 L)	10 m distance to riverbank
		DOM	10 m distance to riverbank
		mini-sediment core	1 m distance to riverbank (0-10,5 cm depth)
		mini-sediment core	1 m distance to riverbank (3-13,5 cm depth)
		mini-sediment core	5 m distance to riverbank, 0.5 m water depth (0-10,5 cm depth)
		sedimentology sample	1 m distance to riverbank (0-6 cm)
		sedimentology sample	1 m distance to riverbank (6-12 cm)
		sediment sample	deposited on tree branch in intertidal area
Station 2	15.08.2006	POM (3 L)	river middle
		DOM	river middle
		sedimentology sample	riverbank sand in between stream-worn cobble
Station 3	15.08.2006	POM (2 L)	riverbank
		DOM	riverbank
		mini-sediment core	at the riverbank (0-10,5 cm depth)
		sediment sample	surface
		sediment sample	5-10 cm
		sedimentology sample	riverbank surface sand
Station 4	16.08.2006	POM (2 L)	riverbank
		DOM	riverbank
Station 5	16.08.2006	POM (3 L)	2 m distance to riverbank
		DOM	2 m distance to riverbank
Station 6	16.08.2006	POM (3 L)	riverbank
		DOM	riverbank
		Sedimentology sample	riverbank surface sand
Station 7	16.08.2006	POM (2 L)	riverbank
		DOM	riverbank
Station 8	16.08.2006	POM (1.5 L)	riverbank
		DOM	riverbank
		sediment sample	surface sample
Station 9	16.08.2006	POM (1.5 L)	riverbank
		DOM	riverbank

Station 10	17.08.2006	POM (4 L)	north riverbank, ash particles
		DOM	north riverbank
		sediment sample	north riverbank, under water
		sedimentology sample	south riverbank, upper 3 cm
		mini-sediment core	south riverbank
Station 11	17.08.2006	POM (4 L)	riverbank
		DOM	riverbank
		sediment sample	2 m distance to riverbank, surface sample
Station 12	17.08.2006	POM (1 L)	riverbank
		DOM	riverbank
		sediment sample	riverbank, surface sample
		sedimentology sample	riverbank
Station 13	17.08.2006	POM (2 L)	riverbank
Station 14	17.08.2006	POM (2 L)	riverbank
		DOM	riverbank

4.2 Seismic and Sedimentacoustics

(S. Krastel, F. Strozyk, M. Wagner-Friedrichs)

Three different acoustic systems were used during Poseidon Cruise P-342. An Elac Seabeam 1000 sounder was used for bathymetric mapping of the seafloor. Seismic data were collected by means of a Boomer and a high-resolution multichannel seismic system. An outline of the seismic system is shown in Fig. 4.2.1 Technical details of the individual systems as well as first results are described below.

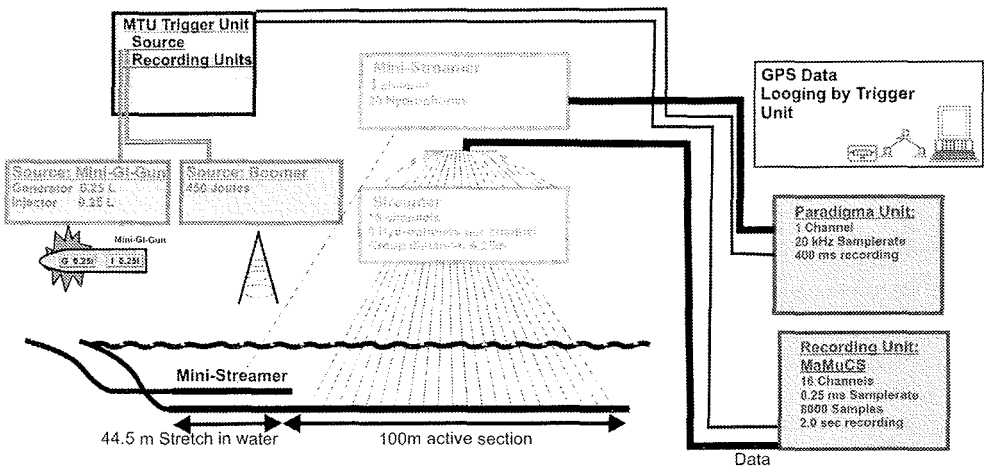


Fig. 4.2.1: Seismic system setup during R/V Poseidon Cruise P-336.

4.2.1. Parameters and Preliminary Data Processing

4.2.1.1 Multibeam mapping

During the P-342 cruise, the ELAC SEABEAM 1000 multibeam echo sounder was used for continuous mapping of the seafloor. The echo sounder consists of several units: (i) a transmit and a receive transducer array is fixed in a moon pool below the keel of the vessel; (ii) a preamplifier unit contains the preamplifiers for the received signals; (iii) the transducer unit contains the transmit and receive electronics and processors for beam-forming and control of all parameters with respect to gain, ping-rate and transmit angles. Furthermore, the system monitors via serial interfaces the ship's motion, such as roll, pitch and heave, external GPS time and vessel position and heading. A high performance PC is used as an Operator station. The Operator station processes the collected data, applies standard corrections, displays the results, and logs the raw data to internal or external disks.

The ELAC SEABEAM 1000 uses a frequency of about 12 KHz with a whole angular coverage sector of up to 120° (60° per port-/starboard-side). One ping is sent and the receiving signal is formed into 191 beams by the transducer unit through the hydrophones in the receiver unit. The beam spacing can be defined as equidistant or equiangular, or a mix of both. Running the system in full 120°-configuration the sounder maps a swath of roughly 4-5 times the water depth. The ping-rate depends on the water depth and the runtime of the signal through the water column. Depending on the state of the sea, an opening angle of 40-120° (deep to shallow water) was used, restricting the coverage to a max 1.2 km wide swath to gain a relatively continuous spacing of beams on the ocean floor. The spacing within this limit was controlled automatically by the echo sounder system.

A CTD-profile (20.08.06, ca. 80 m water depth) and ship parameters were integrated into the HydroStar software, which controls the ELAC echo sounder. An alignment of the transducers, calibrating the swath of the port- and starboard transducer to the roll of the vessel, was carried out at 22.08.06 at around 80 m water depth, tracking two profiles two times (port and starboard calibration). The calculated values of port and starboard roll (p: -0.27/s: 0.88) caused high pitching on the swath borders, so that existing values (P-336, p: -0.32/s: -0.5) were preloaded.

Data storage of 10 MByte files was set to "SSSYYDDmmmHHHMMSS_TTT", which causes a conflict between HydroStar storage used UTC and PC used time (UTC+2 h). Setting the PC time to UTC solved this problem.

4.2.1.2 Boomer system

The Boomer plates and the power supply used during the cruise were provided from the BSH (Bundesanstalt für Seeschifffahrt und Hydrographie). The Mini-Streamer for recording the energy was supplied by Kiel University.

The Boomer plate was a UWAK 05 transducer. The frequency band of this plate is between 300 Hz and 20 kHz. The pulse length is 0.6 µs. The boomer plate was mounted beneath a small surf board in ~20cm beneath the sea surface ~12m behind the vessels stern (see Fig. 4.2.2). The boomer plate was powered and controlled by a PULSAR 2002 power-supply. This unit provides three energy levels from 150 to 450 joules (at 3900 V). We used the 450 joule energy level during the entire cruise. In shallow water depth (<400 m) we shot the boomer every second with a 2 second break after 6 shots. The break was used for firing and recording the GI-Gun (see trigger unit). In water depth > ~400 m < ~900 m we shot the Boomer only 2 times in a 9 second interval (see trigger unit). The Boomer was switched off in water depth > ~900 m.

The energy was recorded by a Mini-Streamer consisting of 20 hydrophones distributed over 3 meters. The streamer was connected to an ORE Geopulse receiver 5210a. The signal was amplified and filtered by this unit. The low and high cut filters were set to 300 Hz and 10 kHz, respectively. The filtered output signal was recorded by a Paradigma system. The sampling frequency was 20 kHz, the recording length was 400ms (300m). The energy was additionally recorded by the multichannel streamer, though only two Boomer shots were recorded between the GI-Gun shots. This procedure allowed to record Boomer data also for water depths >300m. The sampling frequency for this kind of recording, however, was only 250µs, and lateral resolution is decreased as not all shots could be recorded.

The Boomer worked very reliable during the cruise. Some problems occurred at the beginning of the cruise. Due to a missing electrical contact, it was not possible to switch on the high voltage. This problem was solved by the ships electrician. Firing of the Boomer also caused miss-triggers at the MaMuCS system. This problem was solved by the used trigger scheme (see trigger unit). Due to theses problems, Boomer data are only available from 21.08.06, 07:52h UTC (Profile GeoB06-554).

Recording of the Boomer data with the Paradigma System was done without navigati on. The system did not change the dates at midnight in the ps3-files. This is only done after a reset of the system. As we reset the system only in deep water (when the boomer was not fired) or after finishing a survey, the dates in the header values might be wrong. The correct dates can be read from the file names of the ps3-data.

4.2.1.3 Seismic reflection

With the high-resolution multichannel seismic equipment of Bremen University, small scale sedimentary structures and closely spaced layers can be imaged on a meter scale, which can usually not be resolved by means of conventional seismic systems. During R/V Poseidon Cruise P-342, a Mini-Generator-Injector (GI) airgun with reduced chamber volume (2 x 0.25 L, 50-500 Hz) was used as seismic source. Data were recorded with a 100m-long 16 channel

streamer with 8 hydrophones per group and a channel distance of 6.25m. Figs. 4.2.1 and 4.2.2 give an outline of the system setup as it was used during R/V Poseidon Cruise 336.

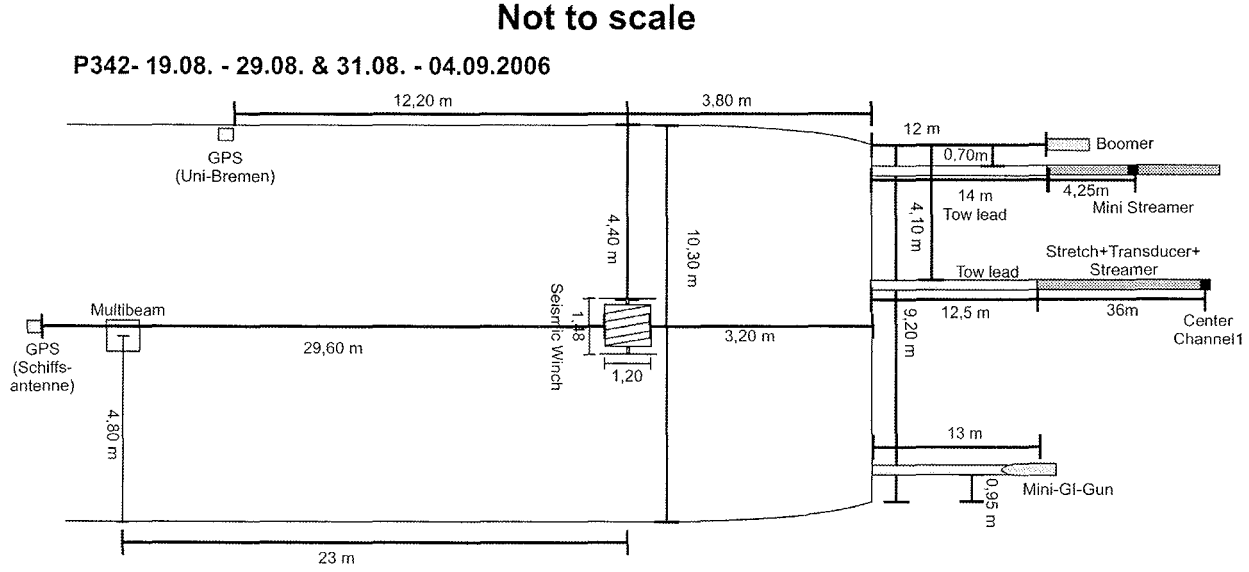


Fig. 4.2.2a: Deck and seismic gun setting during P-336 for Profiles GeoB06-549 to GeoB06-599 as well as Profiles GeoB06-613 to GeoB06-633.

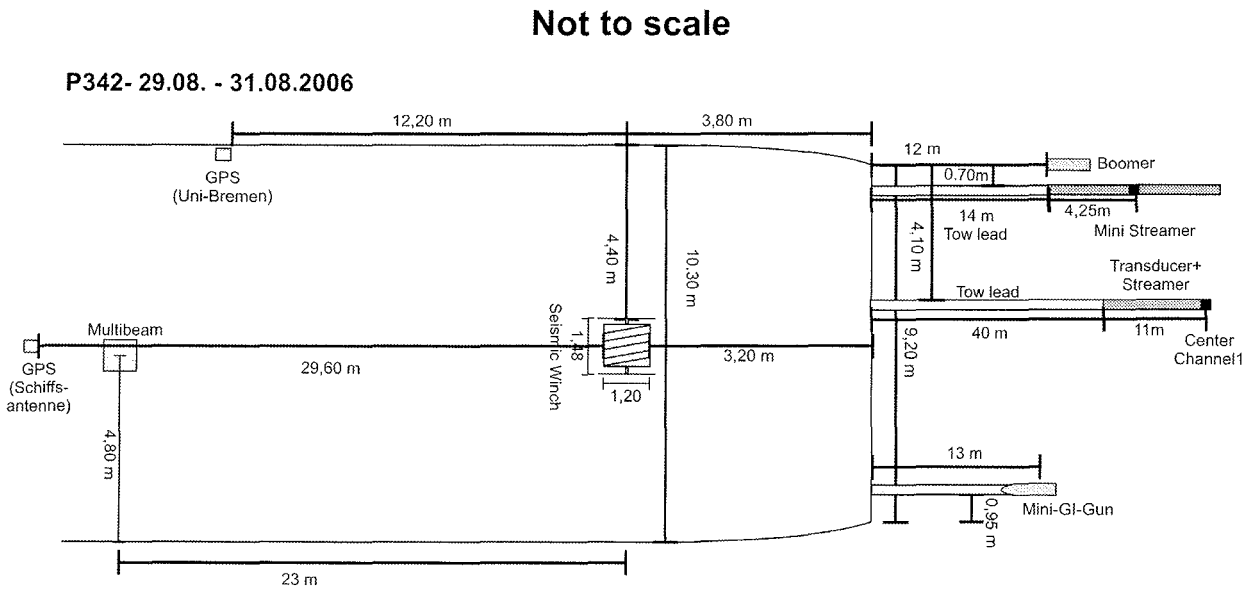


Fig. 4.2.2b: Deck and seismic gun setting during P-336 for Profiles GeoB06-600 to GeoB06-612.

During seismic surveying, a Mini-GI-Gun with reduced chamber volume (2 x 0.25 L) was shot on all seismic lines. The gun was towed at the port side appx. 12.5 m behind the ship's stern Fig. 4.2.2). The gun was connected to a bow with the GI-Gun hanging on two chains 30 cm

beneath. An elongated buoy, which stabilized the guns in a horizontal position at a water depth of ~70 cm, was connected to the bow by two rope loops. The gun was shot in a harmonic mode (same volume of generator and injector). The injector was triggered with a delay of 20 ms with respect to the generator signal, which basically eliminated the bubble signal.
Air was provided by two portable KAP14 Bauer compressors, which provided 380 l/minute of air each. The Mini-Gi-Gun was shot at an air-pressure of ~140-150 bar. The shooting rate was between 8 and 9 seconds depending on water depth (see trigger unit). Speed during seismic profiling was ~ 4 kn resulting in a shot-point distance of ~17 m. The geometry of source and receiver systems during the measurements is shown in Fig. 4.2.2.

The reflection seismic data are obtained using a 101-m-long streamer. It is a 16 channel unit built by Teledyne Exploration Co. in 1993. The system comprises four parts, a 101 m active length, a 25 m stretch section, a 120 m tow leader, and a 75 m deck leader (Fig. 4.2.3). Only 12.5 m of the tow leader were in water during cruise P-342 except for Profiles GeoB06-600 to GeoB06-612 (Fig. 4.2.3b). Due to problems with the streamer (see below) we took the stretch section out of the streamer for these profiles but increased the length of the tow leader in water to 40m.
The active streamer section is separated into 16 groups of 8 hydrophones. Within one group the hydrophones are 0.78 m apart building a 6.25 m long unit (Fig. 4.2.3). The whole unit is stored and operated from a manual winch midship of RV POSEIDON. Tailrope is 20 m. The distance between the sips stern and the midpoint of the first channel is ~ 48.5 m except for Profiles GeoB06-600 – GeoB06-612, where the modified setting resulted in a distance between the sips stern and the midpoint of the first channel of ~ 51 m.
During recording of data several serious noise peaks were detected in the data. Occasionally the number of these peaks increased dramatically and afterwards the sensitivity of the streamer was significantly reduced. As we considered salt water in the streamer for the most likely explanation of the noise peaks, we checked and cleaned all plugs several times during this survey. The noise peaks were the reason for replacing the stretch section for Profiles GeoB06-600 to GeoB06-612. Neither cleaning the plugs nor removing the stretch section showed a major effect. The occasionally occurrence of the noise peaks could not be solved onboard. Nevertheless the data quality for most profiles is excellent.

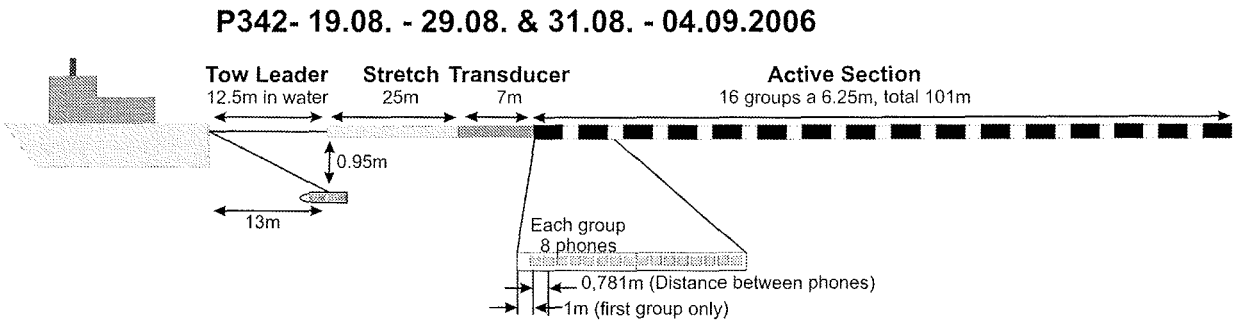


Fig. 4.2.3a: Schematic sketch of the streamer for Profiles GeoB06-549 to GeoB06-599 as well as Profiles GeoB06-613 to GeoB06-633.

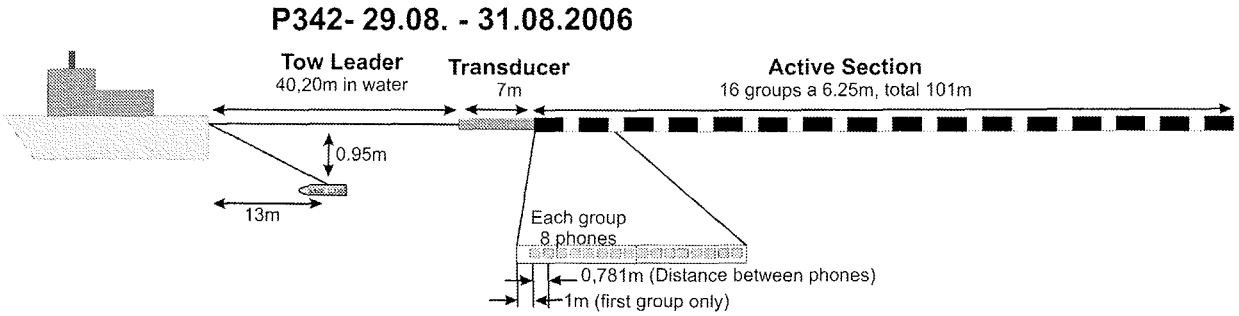


Fig. 4.2.3b: Schematic sketch of the streamer for Profiles GeoB06-600 to GeoB06-612.

The acquisition system used during Poseidon Cruise P-342 was completely developed at the working group marine technology/environmental research at the University of Bremen. The MaMuCS system (Marine MultiChanel Acquisition System) consists of a Pentium IV based PC (3 GHz, 1GB RAM, Windows XP) with one NI6052E 16bit AD-converters. The AD-converted is connected to a 32 channel multiplexer (NI-SCXI1102-C) with onboard preamplification and anti-alias filter. The system therefore provides a maximum of 32 channels at maximum sampling rate of 10 kHz per channel. Sample rate can be increased dynamically if number of channels is reduced.

The acquisition software is also a custom development and provides nearly continuous recording of all channels with data storage in demultiplexed SEG-Y format to hard disk. The software allows online quality control by displaying shot gathers and an online profile plot using brute stacks of arbitrary channels. The online profile can additionally be printed immediately to an attached windows printer and / or stored in SEG-Y format. The acquisition system worked very reliable.

Data were recorded with a sample rate of 250 µs over intervals of 2 - 3 seconds depending on water depth. The delay was adjusted to the water depth (see trigger unit). Data backup was performed by writing recorded files on an external USB-Harddisc with 300 GB capacity as well

as on DVDs. This type of data management allowed immediate postprocessing of the data, which was very important on the cruise for planning purpose and quality control.

The custom trigger unit used during R/V Poseidon Cruise P-342 controls seismic source and acquisition systems (Fig. 4.2.1). The unit is set up on an IBM compatible PC with a Windows NT 4.0 operating system and includes a real-time controller interface card (SORCUS) with 16 I/O channels, synchronized by an internal clock. The unit is connected to an amplifier unit and a gun amplifier unit. The PC runs custom software, which allows to define arbitrary combinations of trigger signals. The PC was additionally used for logging of GPS-data.
Based on the water depth different trigger schemes were used during the cruise. When data were recorded without delay, one GI-Gun shot was followed by 6 Boomer shots. The total trigger period for once cycle was 8 sec. All six Boomer shots were recorded by the Paradigma-System (see above), but additional 2 of the six shot were recorded by the Mamucs-System. By using a delay of 500 ms, one GI-Gun shot was followed by 2 Boomer shots. The total trigger period for one cycle was 9 sec. All shots were recorded by the MaMuCS System. For delays ≥ 1000ms no Boomer was shot. The GI-Gun was shot every 8 seconds and recorded by the MaMuCS-System.

For an immediate evaluation of data quality, brute stacks of the GI-Gun data were produced for each multichannel seismic line. Processing was done with the Vista software (Seismic Image Software Ltd) on a Laptop. Usually the field traces 2-4 were chosen for the brute stacks due to a good signal to noise ratio of these traces. The data were filtered with a wide bandpass (55/110 – 600/800 Hz), corrected for spherical divergence, NMO-corrected and thereafter simply summed up. These images were used for preliminary analyses of the seismic data.

4.2.2. Shipboard Results of acoustic profiling

Bathymetric data were recorded continuously during the cruise. The swath width of the mutlibeam sounder was relatively low due to the shallow water depth on the shelf. No systematic mapping was carried out with the multibeam sounder resulting in isolated stripes with bathymetric data. Due to the limited use of these data no examples of the multibeam data are shown in this report.
The multichannel seismic and boomer lines were collected to image subsurface structures of the Galician shelf and the upper continental slope. In total we collected about 1900 km of seismic lines (Figs. 4.2.4 – 4.2.6). The structure of the shelf significantly changes from North to South. In the following we present (if available) boomer lines crossing the selected stations for coring. Thereafter we show some examples of multichannel seismic lines collected on the shelf and the continental slope.

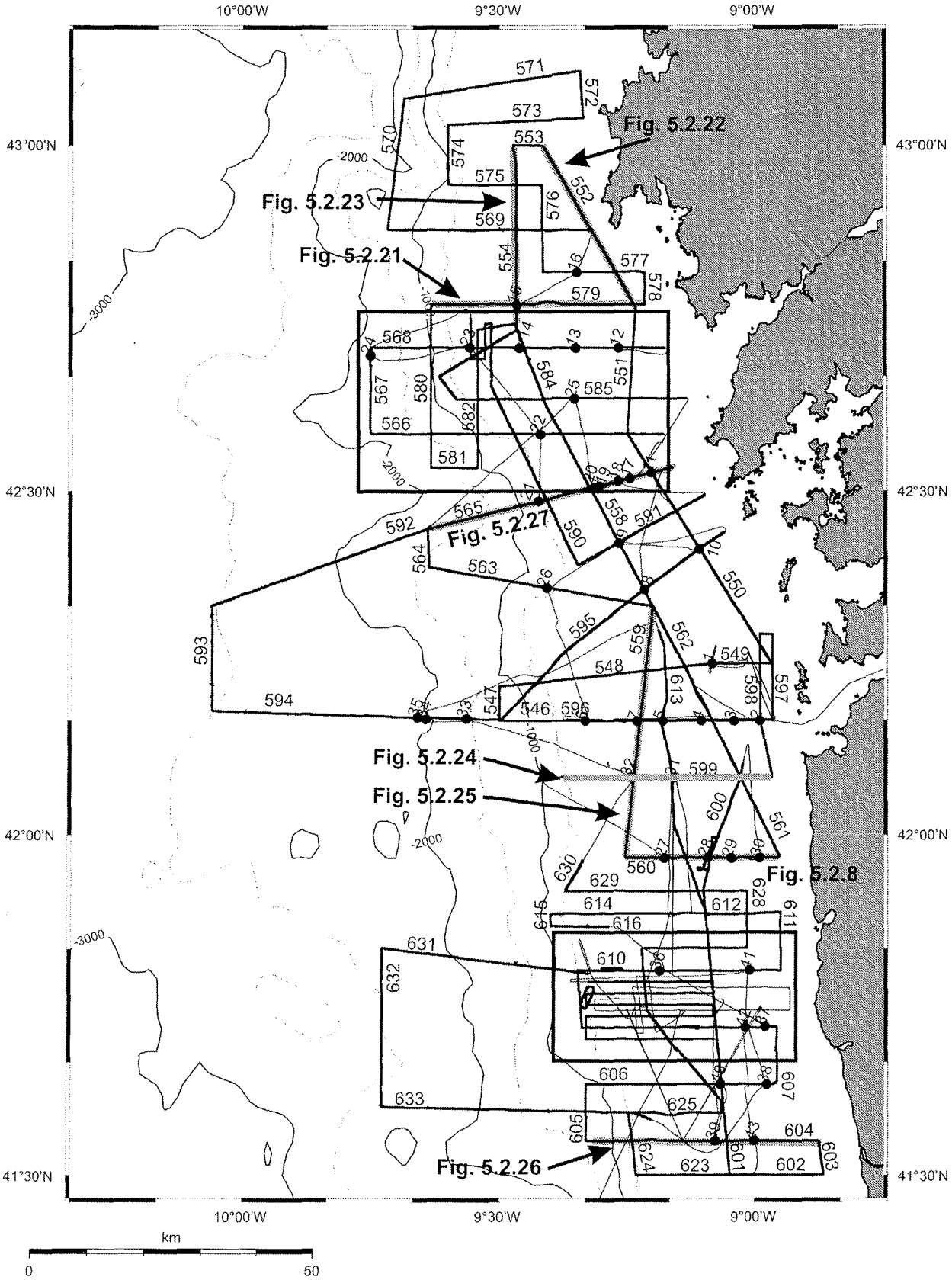


Fig. 4.2.4: Location of Seismic Profiles and Stations during Cruise P-342.

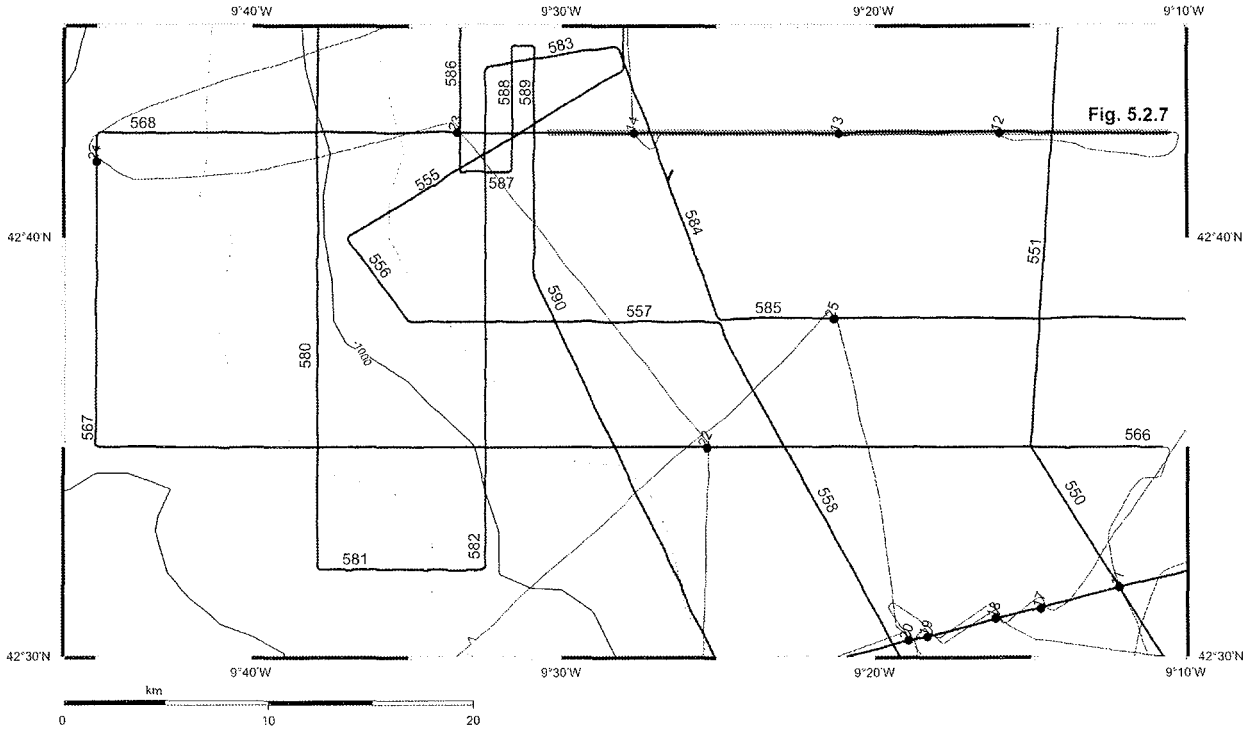


Fig. 4.2.5: Close up of track chart of the survey area between 42°30'N and 42°45'N.

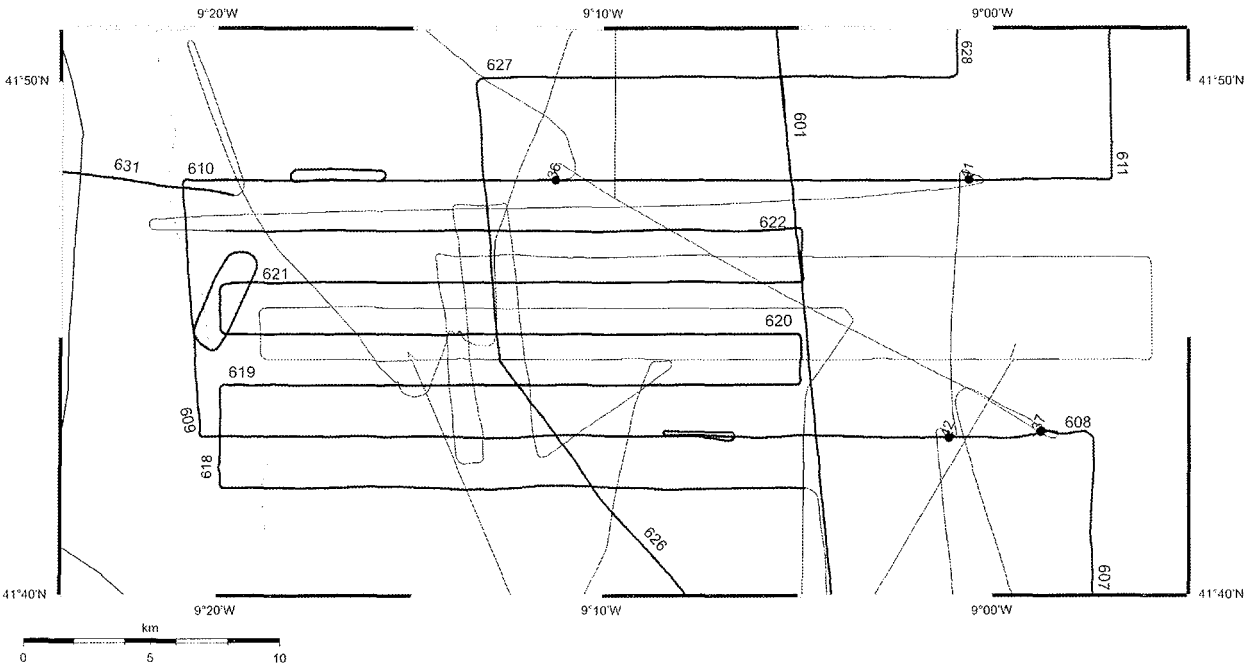


Fig. 4.2.6: Close up of track chart of the survey area between 41°40'N and 41°51'N.

4.2.2.1 Preliminary Results of Boomer Profiling

Boomer profiles collected across the shelf demonstrate the great lateral variability of the shelf sediments. The Boomer profiles were the basis for selecting the coring stations. Boomer Profile GeoB06-568 (Fig. 4.2.7) shows a typical example of the northern survey area. Core

GeoB11012 was taken west of an outcrop, which sticks up above the surrounding seafloor for more than 40 m. The uppermost sedimentary unit west of the outcrop is characterized by a transparent acoustic seismic facies. The thickness of this unit is several meters. This unit represents the Galician mud belt, which is an elongated body with an extension of 100 km x 10 km. The base of the mud belt is marked by a continuous distinct high amplitude reflector. A very similar pattern is found immediately east of the outcrop. Two additional transparent units each ~10 m thick were imaged beneath the strong reflector. These units are separated by a low amplitude reflector. These two transparent units sit on top of an unconformity. This unconformity probably represents the top of a clinoform, which is clearly visible on seismic profiles in this area (see Fig. 4.2.21). Thus the Boomer profile clearly shows an up to 20 m thick cover on top of the clinoform. The unconformity is coming closer to the surface close to the shelf edge, but does not reach the surface. Core GeoB11013 is located at the western edge of the mud belt but a very thin sedimentary unit is imaged on top of the mud belt at this station (Fig 4.2.7). West of this location the two transparent units beneath the mud belt quickly thin out and disappear close to the shelf edge. Core GeoB11014 was taken close to the shelf edge, where the boomer data show a sediment wedge.

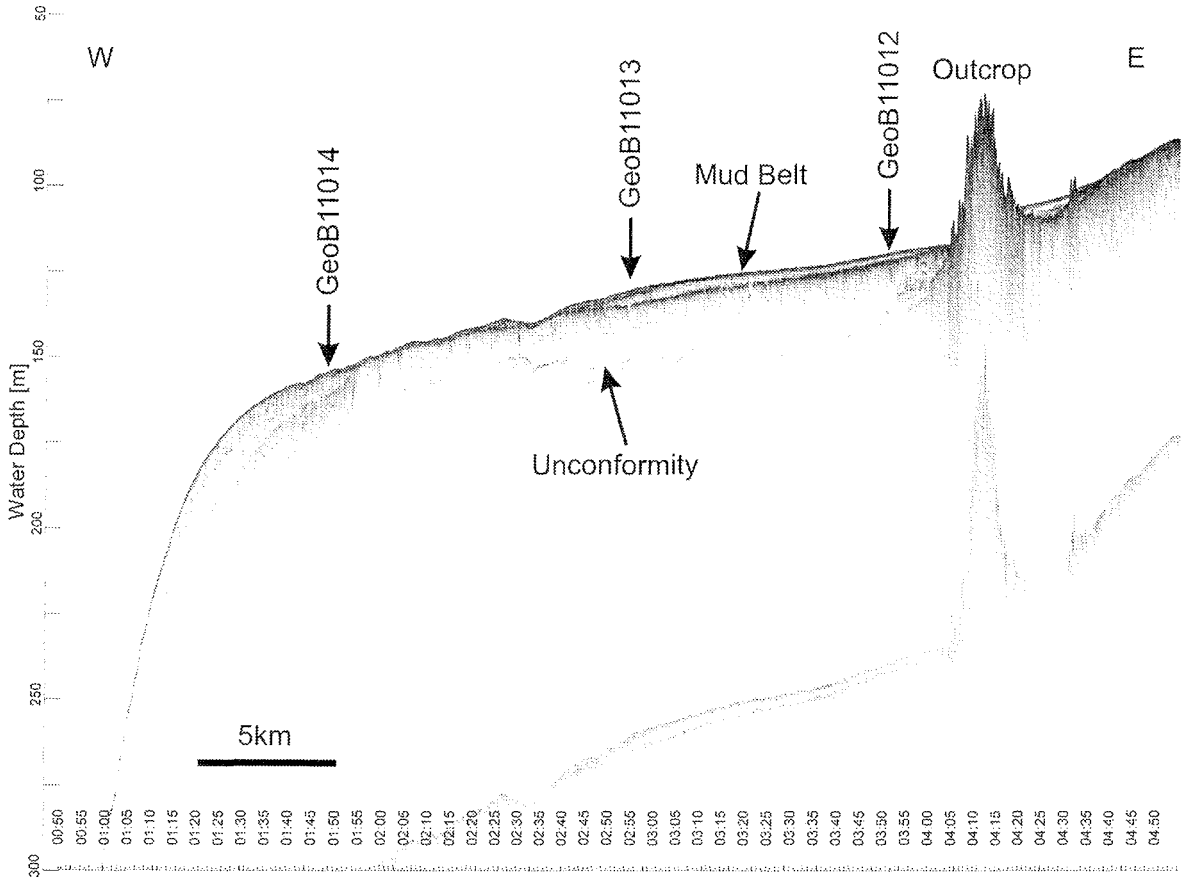


Fig. 4.2.7: Boomer Profile GeoB06-568 with Stations GeoB11012 to GeoB11014. See Fig. 4.2.5 for location.

Boomer Profile GeoB06-560 (Fig. 4.2.8) gives a typical example of a the area directly south of the Rio de Vigo. This profile shows great lateral variability from west to east. The western area close to the shelf edge shows an rock outcrop with an irregular surface. East of this outcrop an erosional unconformity almost reaches the surface. Steeply inclined reflectors are imaged beneath the unconformity. This unconformity is also clearly visible on the seismic data (see Fig. 4.2.24). Sediment thickness above the unconformity increases to the east. Several transparent units were stacked in the in the surrounding of Stations GeoB11027 and GeoB11028. East of Stations GeoB11028 a well stratified sequence is imaged on top of the transparent units. Core GeoB11030 was taken at a location, where the well stratified sequence pinches out. Further to the east the sedimentary cover is getting thinner and a high amplitude reflector representing the acoustic basement is coming to the sea floor. At the very eastern part of the profile two thin transparent units were imaged above the acoustic basement reflector. Profile GeoB06-560 (Fig. 4.2.8) nicely illustrates the coring strategy during the cruise. Based on the Boomer data we sampled the different units identified in the data.

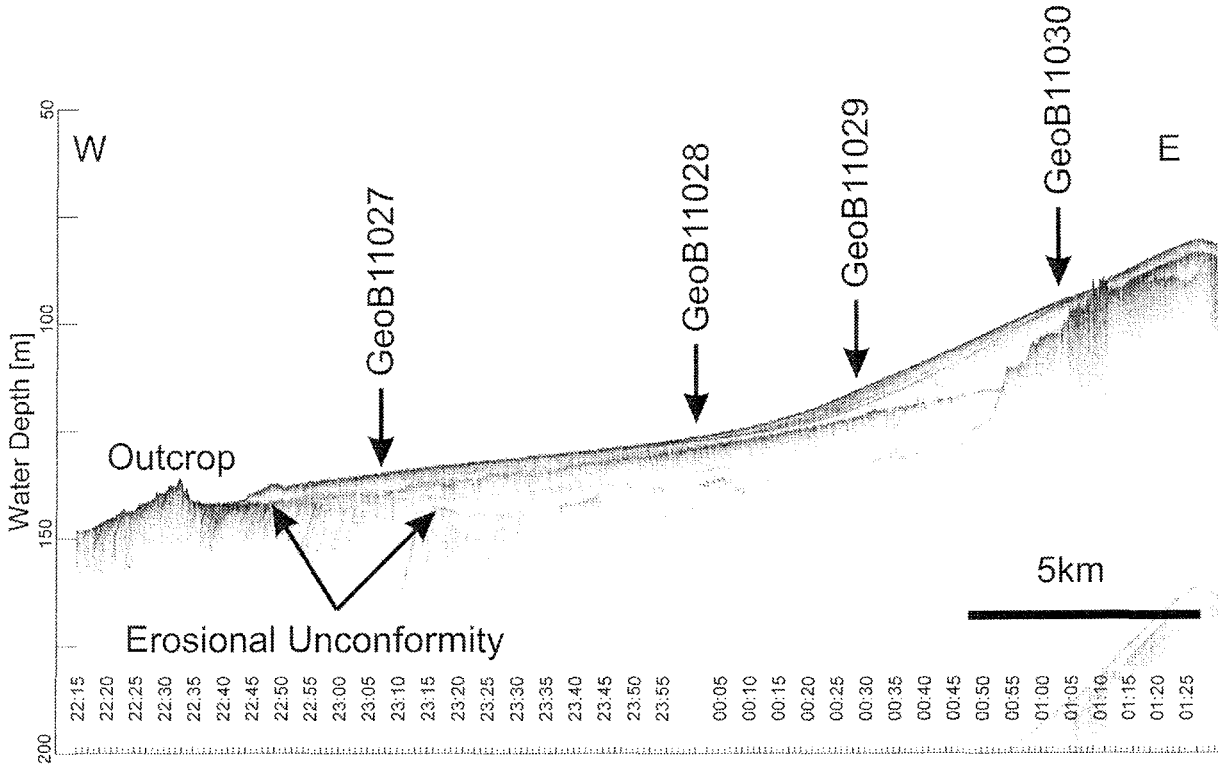


Fig. 4.2.8: Boomer Profile GeoB06-560 with Stations GeoB11027 to GeoB11030. See Fig. 4.2.4 for location.

Boomer data are generally available for all coring locations in water depth shallower than 300 m. Boomer data were only recorded up to 300 m with the Ministreamer. Some Boomer data

were collect up to 900 m water depth with the large streamer, but the vertical resolution is significantly reduced due to the sampling rate of 250 µs and horizontal resolution was reduced due to a reduced shooting rate. In the following (Figs. 5.2.9 – Figs. 5.2.20) we show all available Boomer profiles from North to South, which were collected with the Ministreamer across the coring locations.

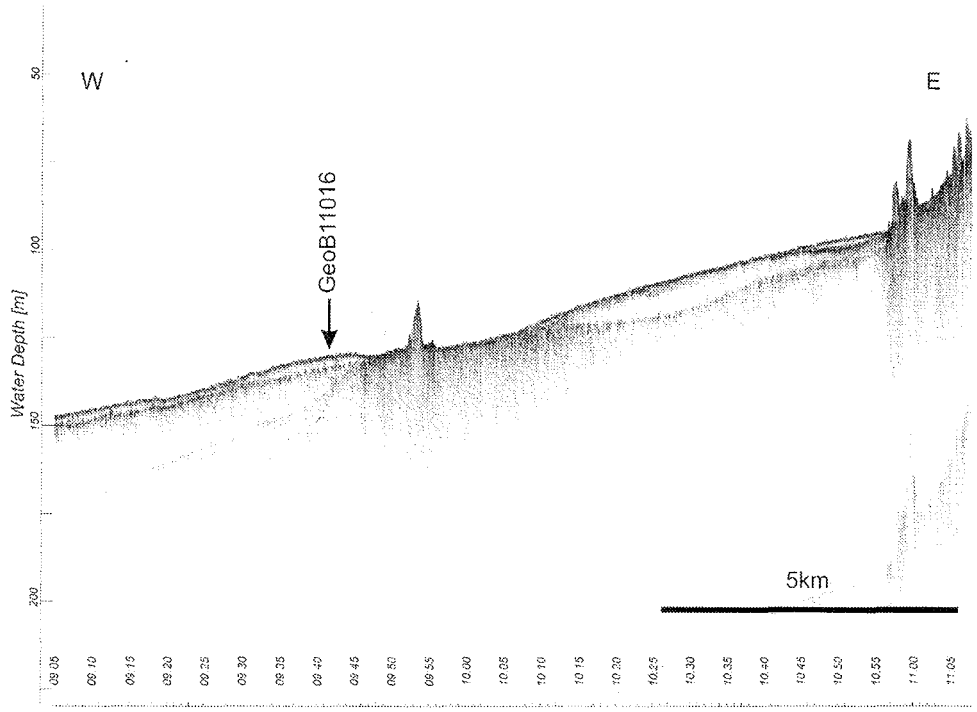


Fig. 4.2.9: Boomer Profile GeoB06-577 with Station GeoB11016.

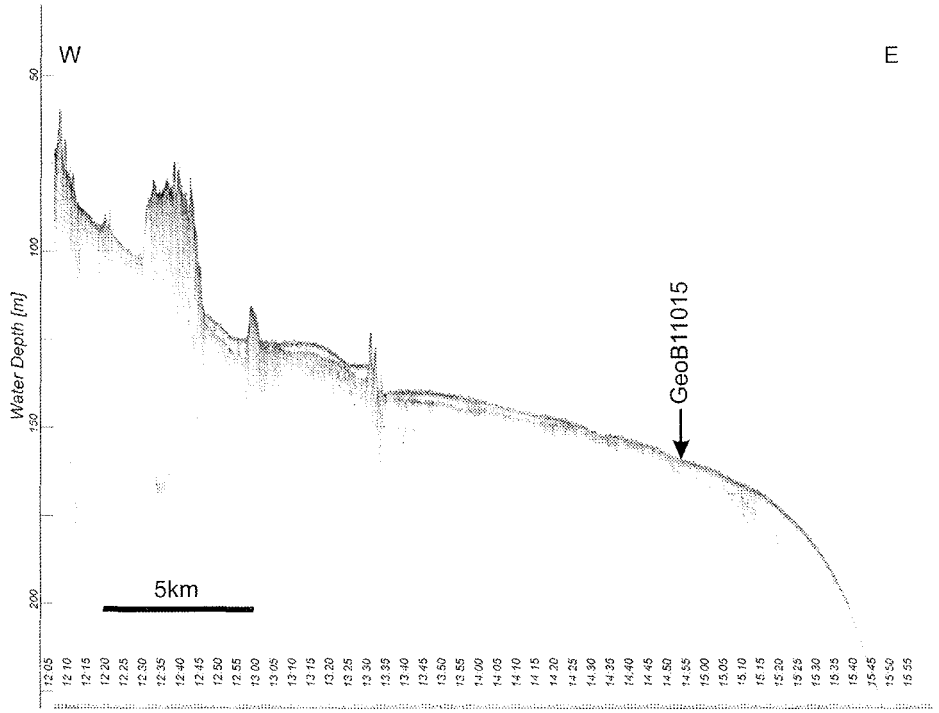


Fig. 4.2.10: Boomer Profile GeoB06-577 with Station GeoB11015.

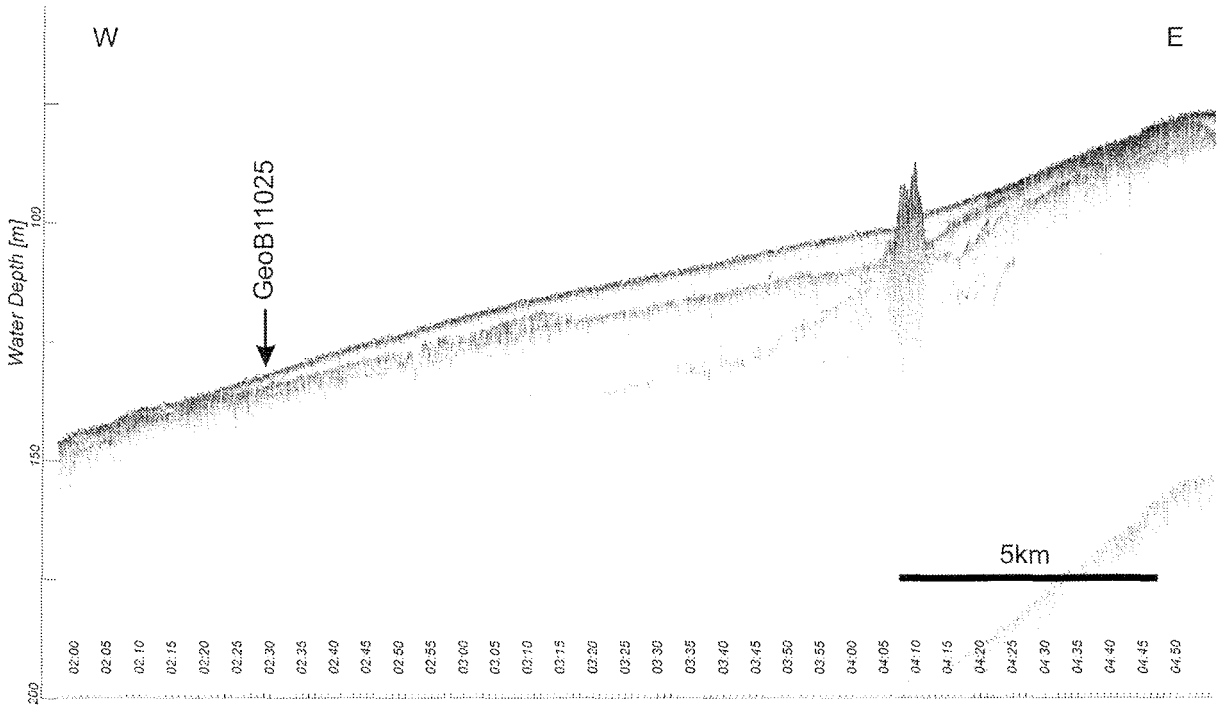


Fig. 4.2.11: Boomer Profile GeoB06-585 with Station GeoB11025.

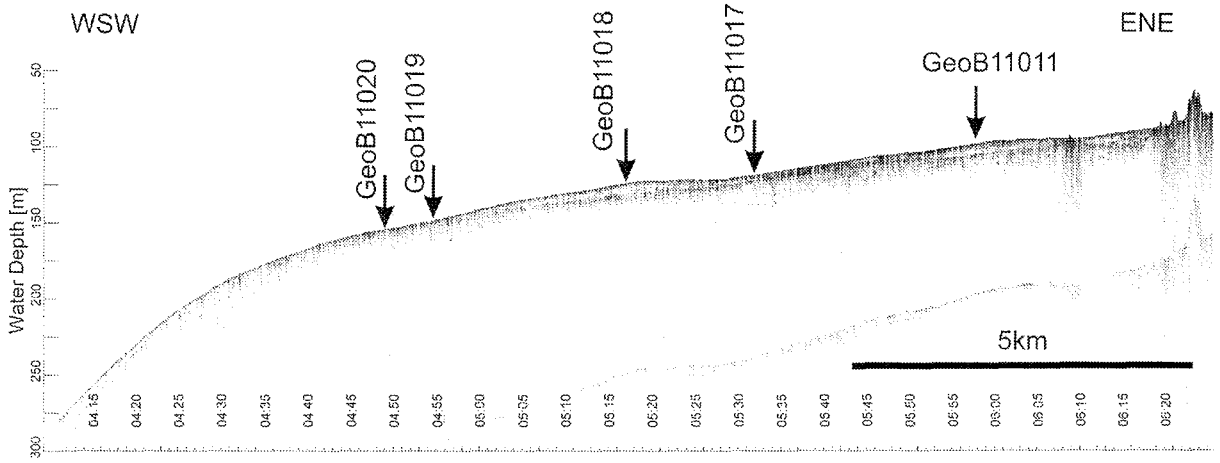


Fig. 4.2.12: Boomer Profile GeoB06-565 with Stations GeoB11011 and GeoB11017 - GeoB11020.

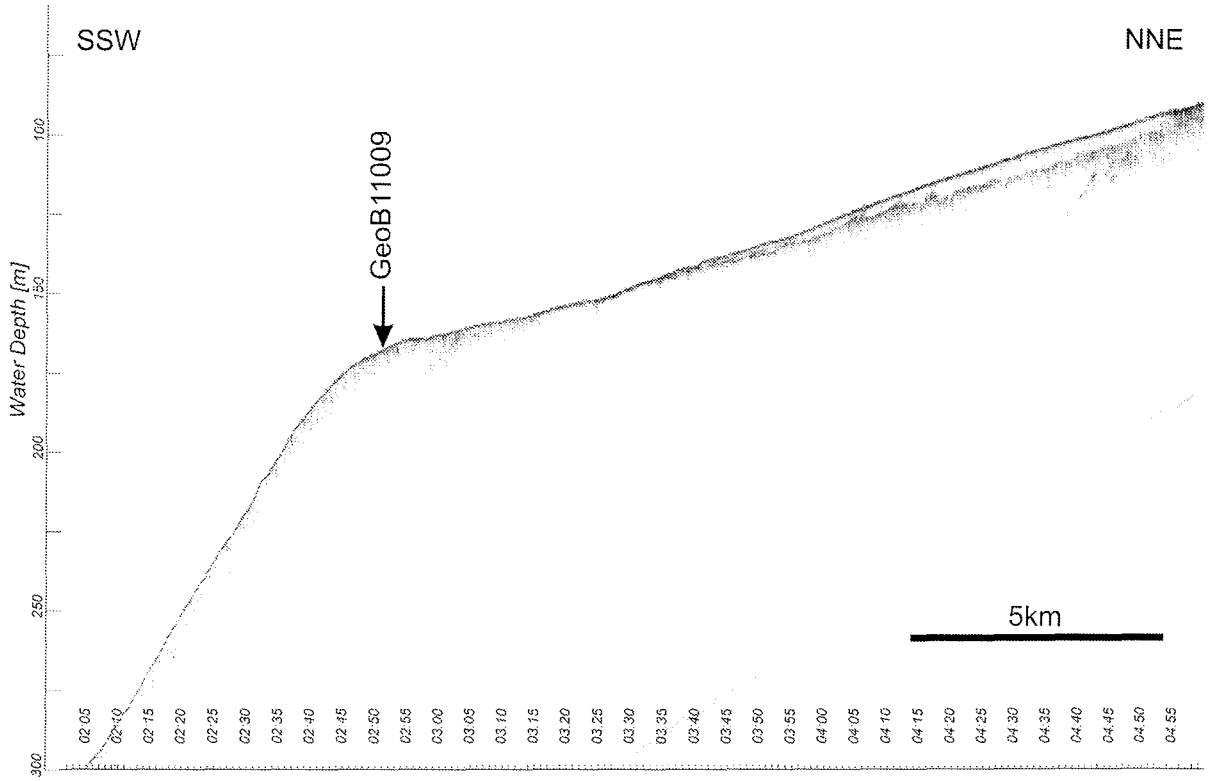


Fig. 4.2.13: Boomer Profile GeoB06-591 with Station GeoB11009.

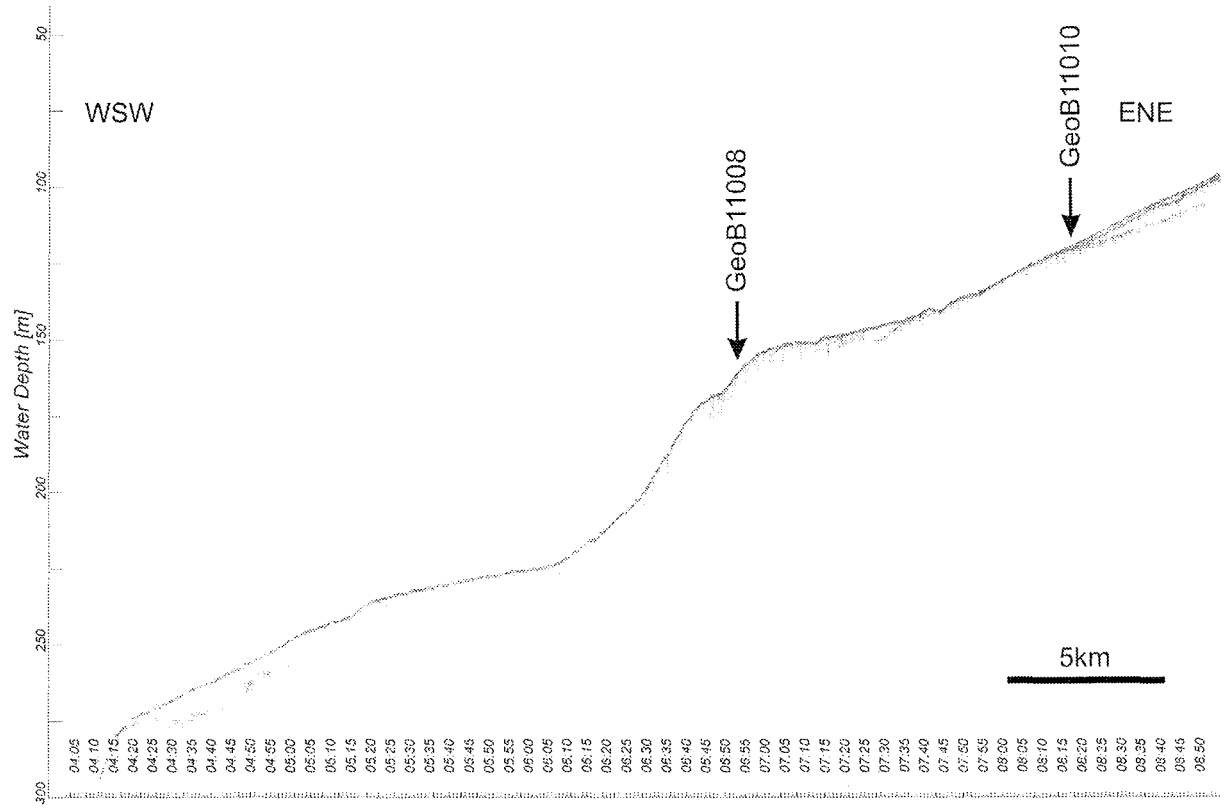


Fig. 4.2.14: Boomer Profile GeoB06-595 with Stations GeoB11008 and GeoB11010.

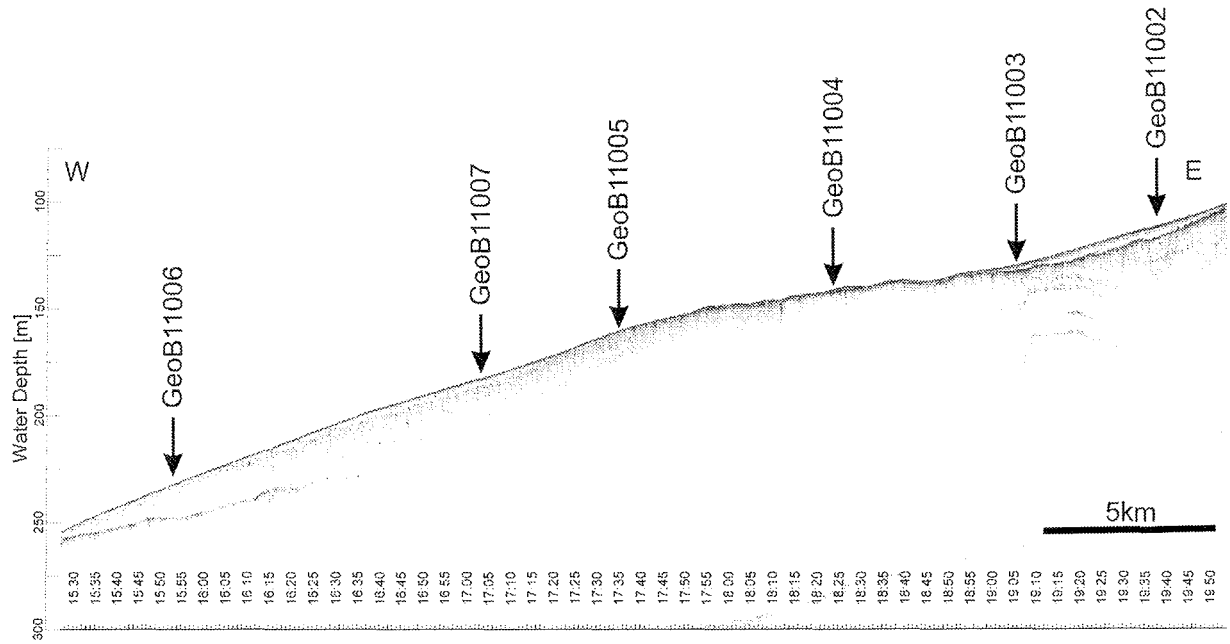


Fig. 4.2.15: Boomer Profile GeoB06-596 with Stations GeoB11002 - GeoB11007.

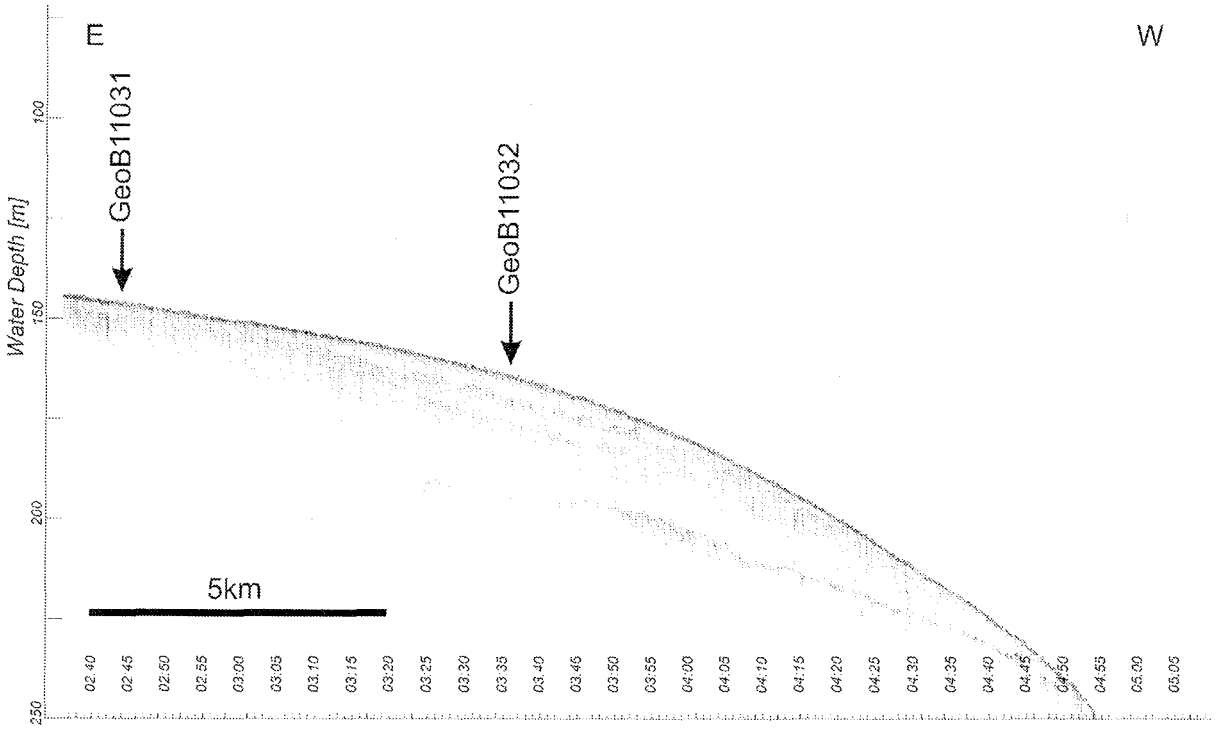


Fig. 4.2.16: Boomer Profile GeoB06-599 with Stations GeoB11031 and GeoB11032.

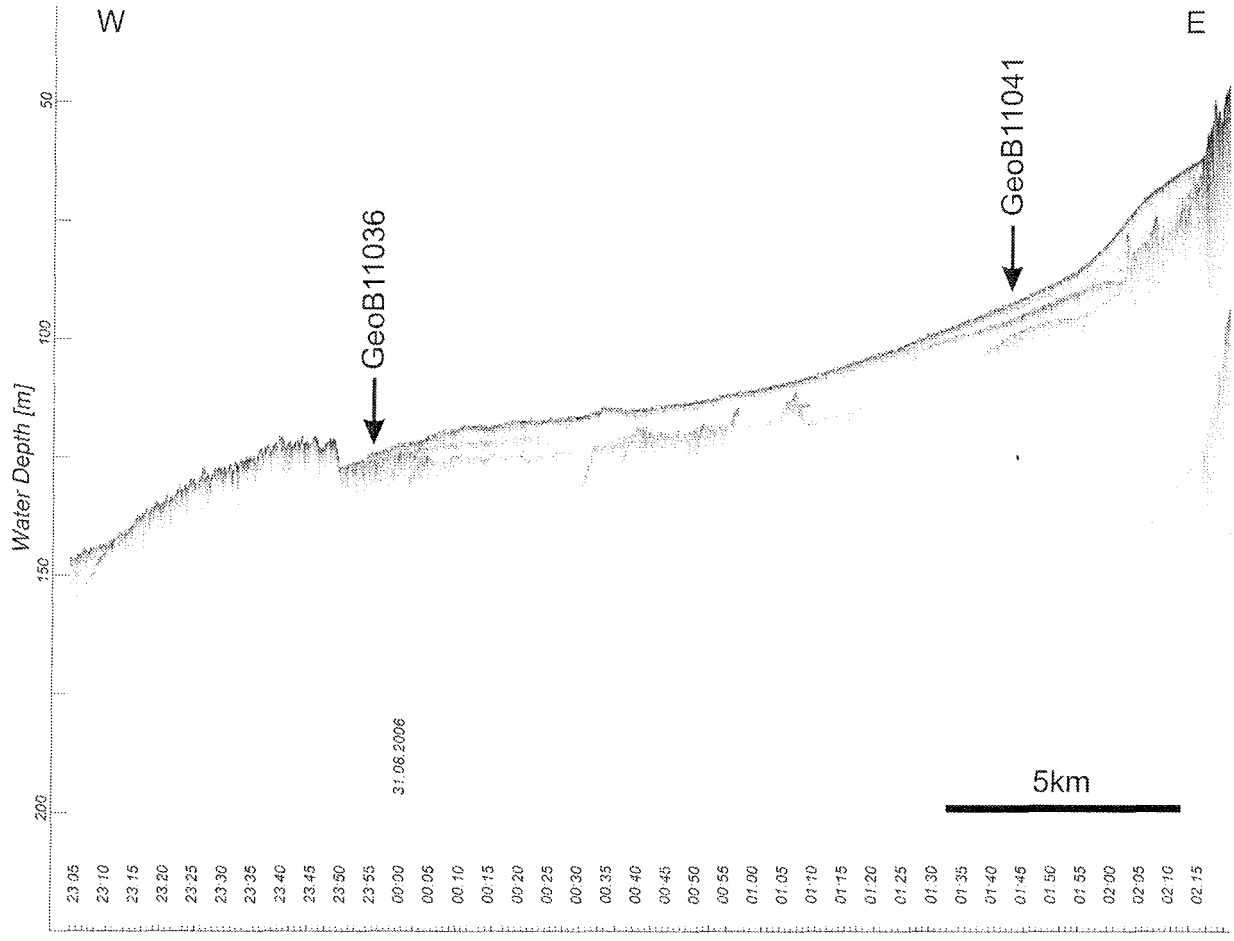


Fig. 4.2.17: Boomer Profile GeoB06-610 with Stations GeoB11036 and GeoB11041.

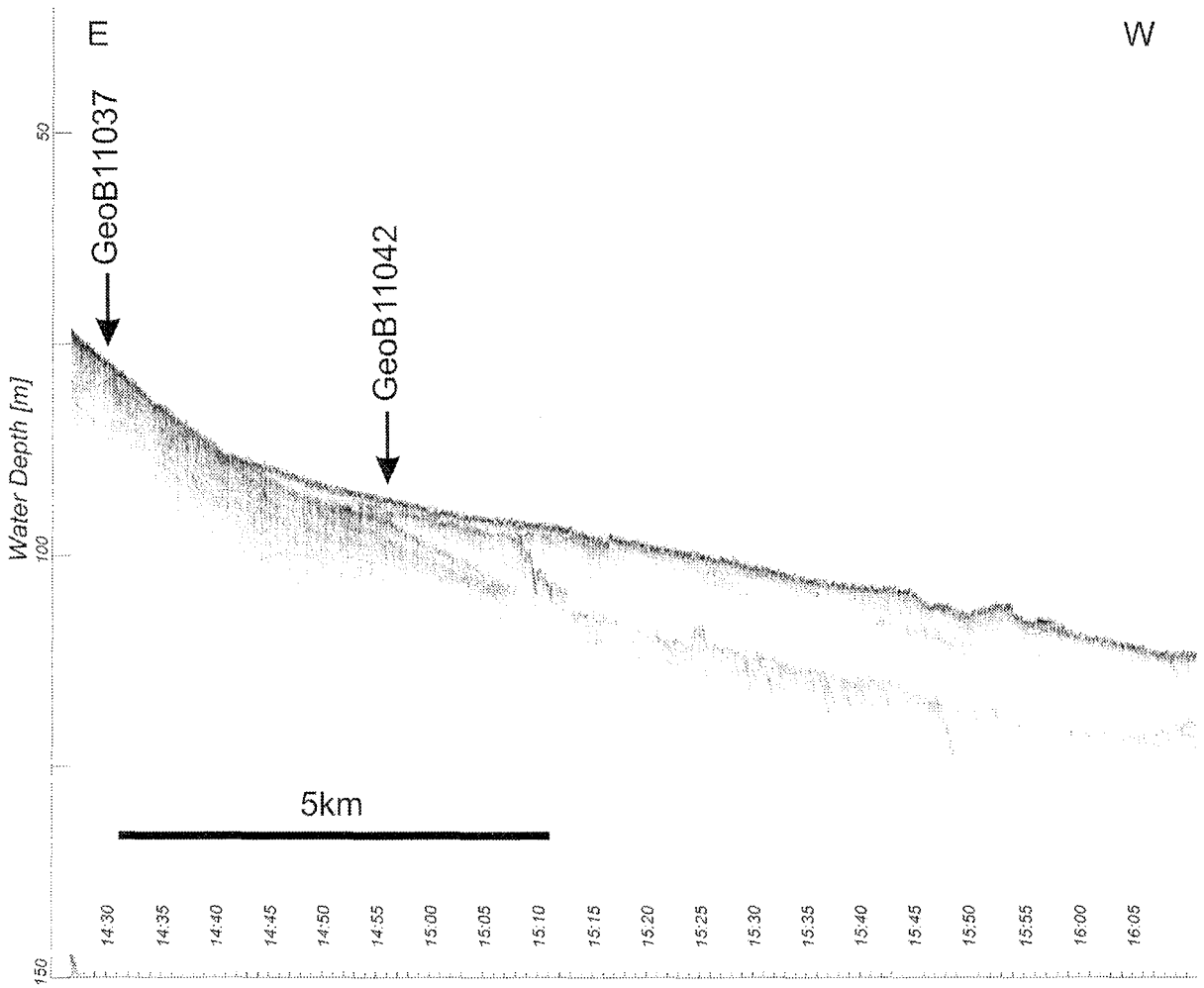


Fig. 4.2.18: Boomer Profile GeoB06-599 with Stations GeoB11037 and GeoB11042.

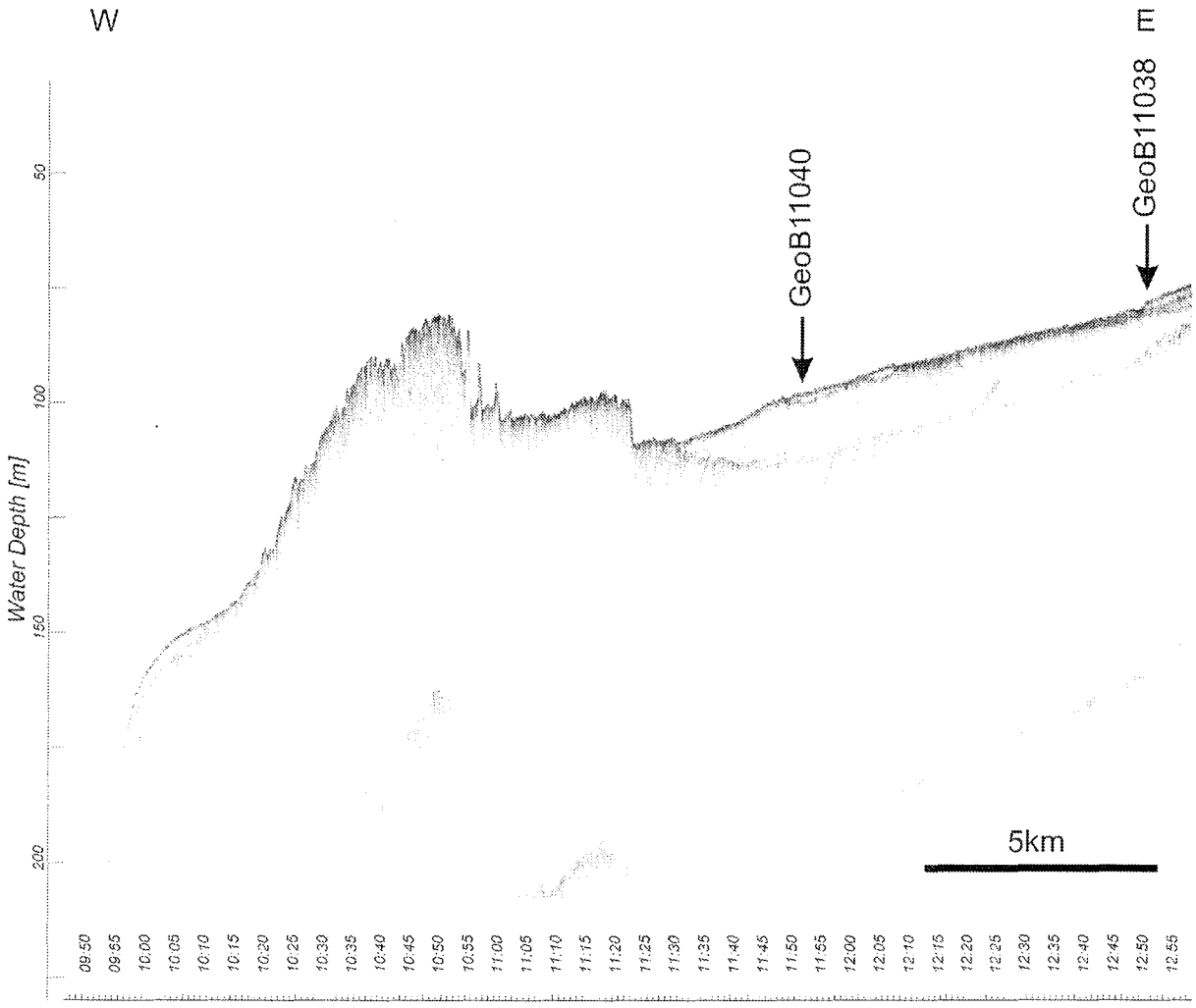


Fig. 4.2.19: Boomer Profile GeoB06-606 with Stations GeoB11038 and GeoB11040.

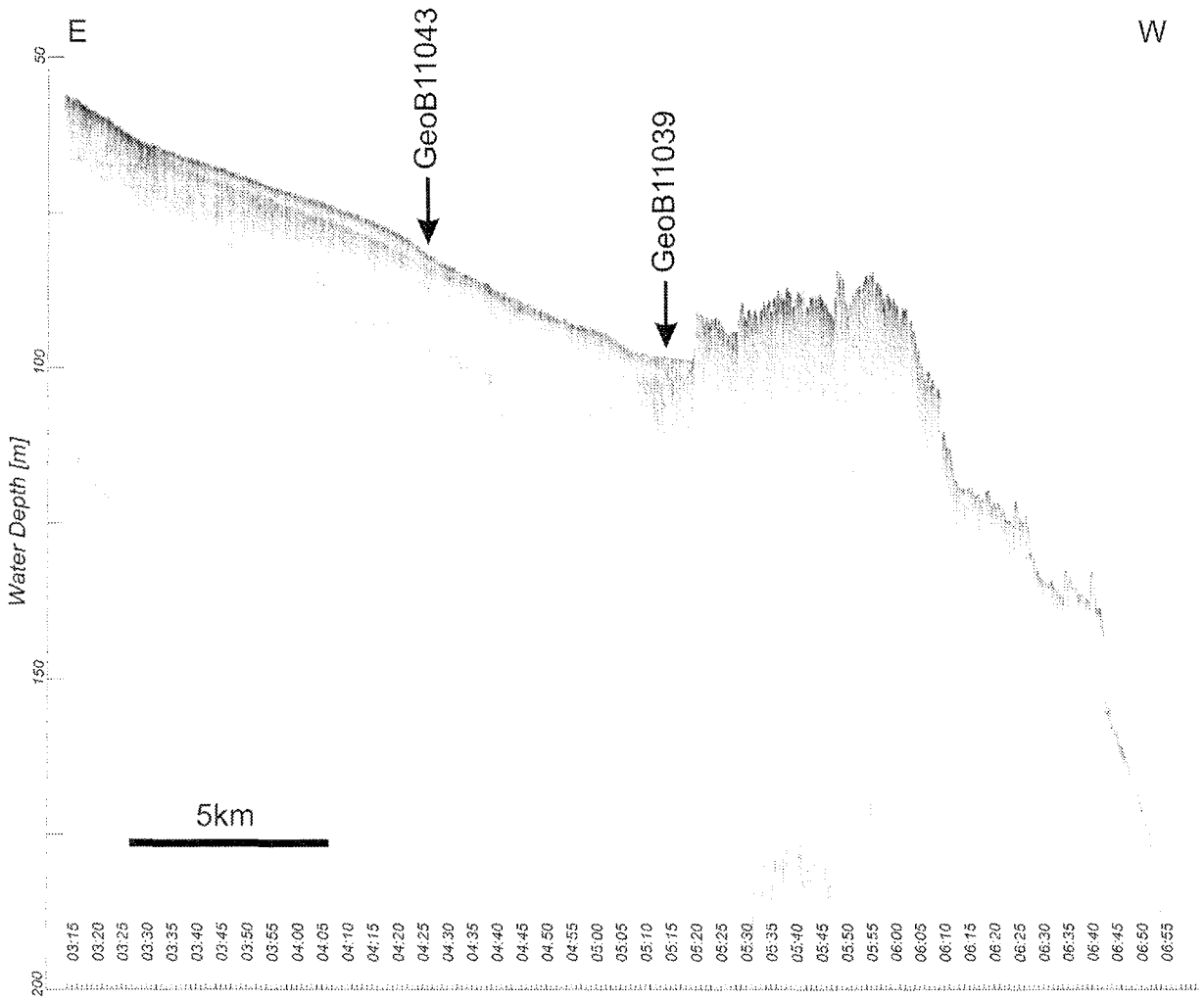


Fig. 4.2.20: Boomer Profile GeoB06-604 with Stations GeoB11039 and GeoB11043.

5.2.2.2 Preliminary Results of Multichannel Seismic Profiling

The seismic lines allow to image subsurface features on the Galician shelf and the adjacent continental slope. Significant differences in the subsurface structure were found over the survey area.

Profile GeoB06-579 (Fig. 4.2.21) is recorded in the northern part of the survey area about 10 km south of Cap Finisterre. The Profile starts ~10 km off the coast and runs ~40 km to the west crossing the shelf edge and ending on the upper continental slope (the western most part of the profile is not shown on Fig. 4.2.21). The water depth at the eastern end of the profile is ~75 m but suddenly increases to ~120 m west of a major rock outcrop. From there on the profile gently dips with a slope gradient of ~0.1° to the shelf edge, which is found in ~180 m water depth. Shelf width is ~40 km. Several outcrops were identified in the eastern part of the profile. The largest outcrop has a diameter of ~2 km and a height of almost 40 m above the surrounding seafloor. Penetration of the seismic signal between the outcrops is low, though some sediment lenses are visible between the outcrops. A thick clinoform is imaged west of

the outcrops. The thickness of the clinoform reaches up to ~200 ms TWT (Two-Way-Traveltime). The inclined reflectors show downlap structures on the lower boundary of the clinoform. Inclination of the reflectors is in the range of 1° slightly increasing to the shelf edge. The reflectors are general characterized by good continuity and a wavy pattern but continuity is significantly reduced for the uppermost sediments at the shelf edge. The clinoform seems to be overlain by a thin cover (~10 m) of almost horizontally layered sediments though the detection of this cover is at the limit of the resolution of the used system. The Boomer data, however, clearly show that a thin sedimentary cover is deposited on top of the clinoform (Fig. 4.2.7). The reflectors beneath the clinofom are clearly truncated by the basal reflector of the clinoform. This erosional unconformity suggests major erosive phases during the evolution of the shelf. The ~4° steep upper continental slope does not show a major sediment cover on the seismic data.

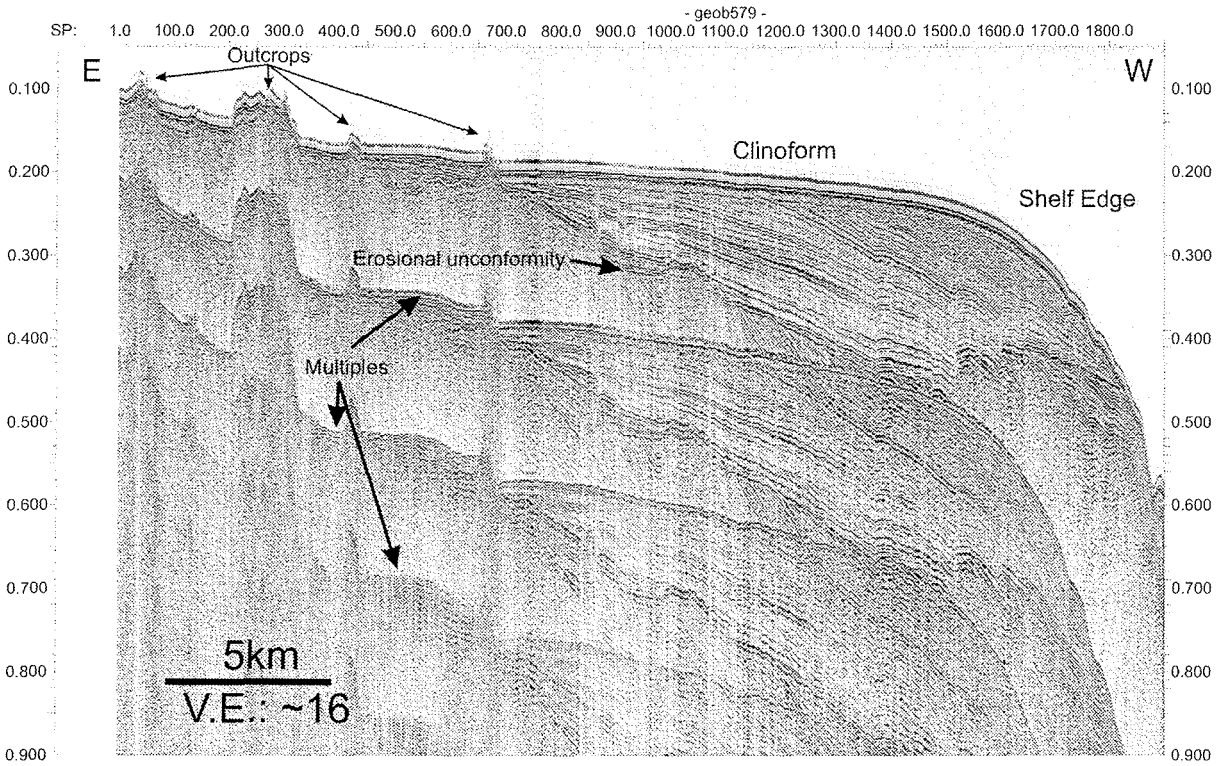


Fig. 4.2.21: Brute stack of Profile GeoB06-579. See Fig. 4.2.4 for location.

Profiles GeoB06-552 (Fig. 4.2.22) and GeoB06-554 (Fig. 4.2.23) were collected perpendicular to Profile GeoB06-579 (Fig. 4.2.21) described above. Profile GeoB06-552 (Fig. 4.5.22) runs parallel to the coast in southeast-northwest direction along the inner shelf. This profile is characterized by numerous peaks arising up to ~50 m above the surrounding seafloor. The seismic facies of these peaks is characteristic for rocky outcrops. Seismic penetration is low. Some thin (10 m-20 m) thick sediment lenses are visible between the outcrops. These

sediment lenses show acoustic transparency indicating relatively homogenous sediments. Some weak deeper reflection patches are imaged but they cannot be traced over larger distance.

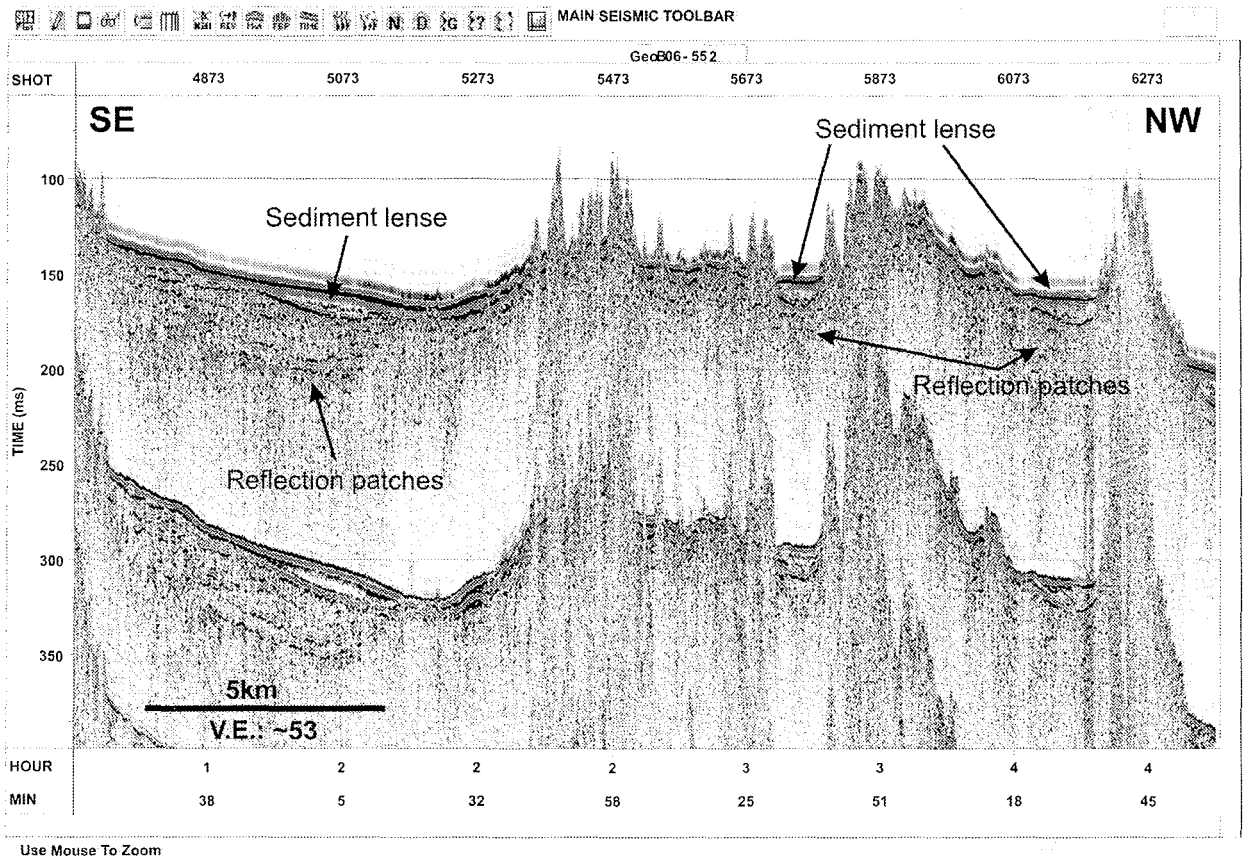


Fig. 4.2.22: Brute stack of Profile GeoB06-552. See Fig. 4.2.4 for location.

Seismic Line GeoB06-554 (Fig. 4.2.23) is collected on the outer shelf in a south-north direction. Average water depth is ~170 m. The upper part of the profile is characterizes by sub-parallel continuous reflectors with varying amplitudes. Only the uppermost reflectors at the southern end of the profile show a slightly reduced continuity. The unit reaches a maximal thickness of 250 ms TWT. This unit is the clinoform already described on Profile GeoB06-579 (see Fig. 4.2.21). In the central and southern part of the profile this unit terminates with a toplap relationship against the seafloor though a closer look at the seismic and the Boomer data indicate a thin (~10 m) thick cover on top of the clinoform. The clinoform shows increasing thickness to the South, which is partly caused by a divergent reflection pattern. The main reason for the increasing thickness, however, are additional younger sediments at the upper part of the clinoform, which are absent in the North. The inclination of the reflectors is much lower than on Profile GeoB06-579. Therefore the main dip direction for the reflectors is to the West, which is consistent with the interpretation of this unit as a clinoform. The base of the

clinoform is marked by a continuous very strong reflector. Only some short reflection patches were identified beneath the clinoform but they are clearly truncated by the base reflector of the clinoform.

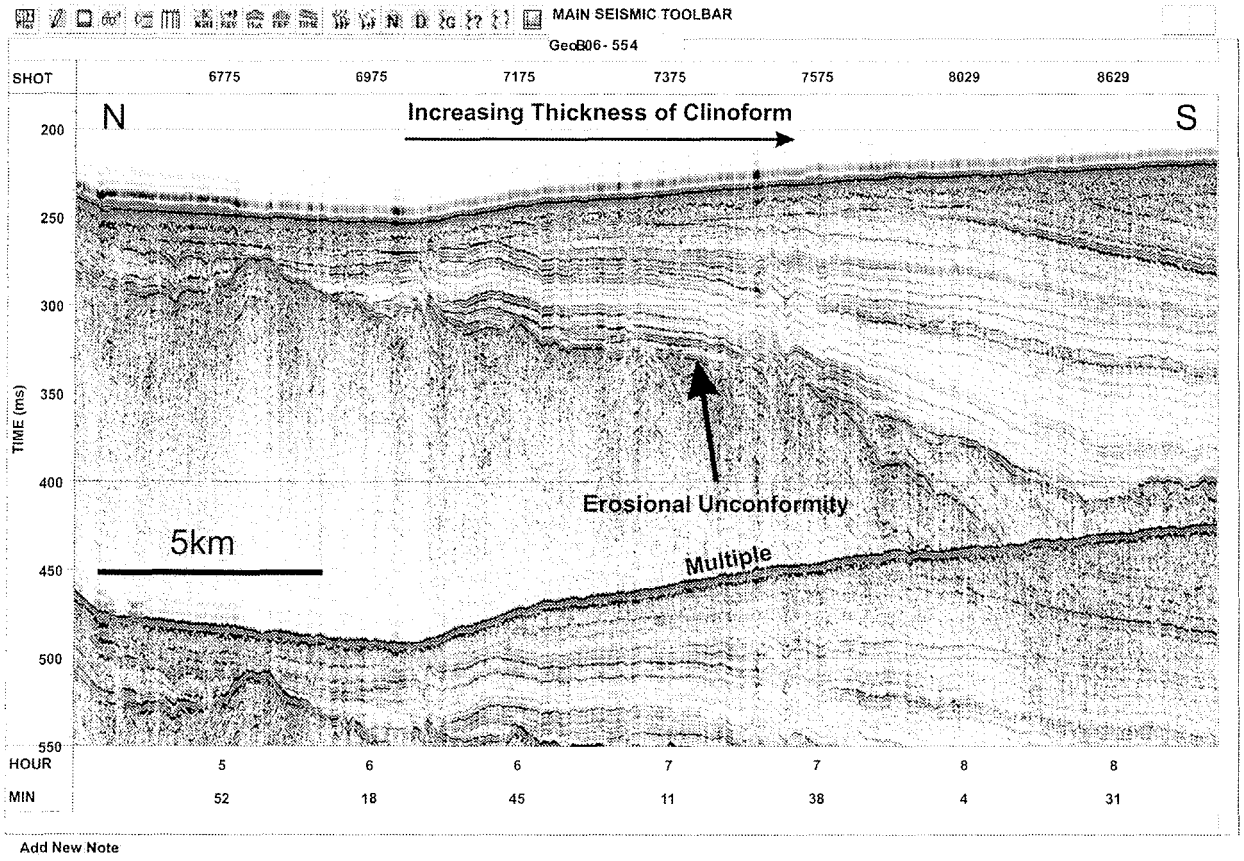


Fig. 4.2.2.3: Brute stack of Profile GeoB06-554. See Fig. 4.2.4 for location.

While the northern part of the survey area shows a thin sedimentary cover on top of a thick prograding sequence, which in turn is underlain by steeply inclined truncated reflectors, a different setting is found in the central survey area. Seismic Profile GeoB06-599 (Fig. 4.2.24) represents a typical image of the central survey area. The profile is located immediately south of the Rio de Vigo and starts ~6 km off the coast. From there on it runs for 40 km to the west, crosses the shelf edge and ends in ~500 m water depth. Water depth at the eastern coastal end of the profile is ~90m; the shelf edge is in ~240 m depth. The shelf gently dips with a slope angle of ~0.1-0.2° but slightly steepens to ~0.3°-0.4° close to the shelf edge. The seismic section images two units, which are separated by a very pronounced erosional unconformity. The lower unit (Unit 3, see Fig. 4.2.24) consists of steeply inclined reflectors with moderate continuity. The reflectors are folded and faulted at some locations. Unit 3 almost reaches up to the sea floor at the shelf edge. Munos et al (2003) suggested that Cretaceous rocks are present at the shelf edge at some parts of the Galician shelf. Hence Unit 3 might be of

Cretaceous age. Unit 1/2 is separated to Unit 3 by an erosional unconformity. Unit 1/2 is characterized by relatively weak reflectors showing a moderate continuity. Several terminations, especially toplaps, downlaps and onlaps can be found in this unit indicating the importance of lateral sediment transport in this unit. A subdivision of this unit is probably possible but would require a fully processed data set. Profile GoB06-559 (Fig. 4.2.25) crossing Profile GeoB06-599 (Fig. 4.2.24) supports a further subdivision of the upper unit, which is the reason to name it Unit 1/2. Maximal thickness of this unit is ~60m but it is almost absent close to the shelf edge as well as close to the coast. The occurrence of possibly Cretaceous sediments (Unit 3) directly overlain by a thin younger unit shows, that major erosive phases have regularly occurred in the survey area. Sediments which were most likely deposited on the shelf during times of sea level high stands were eroded during a following period of sea level low stand.

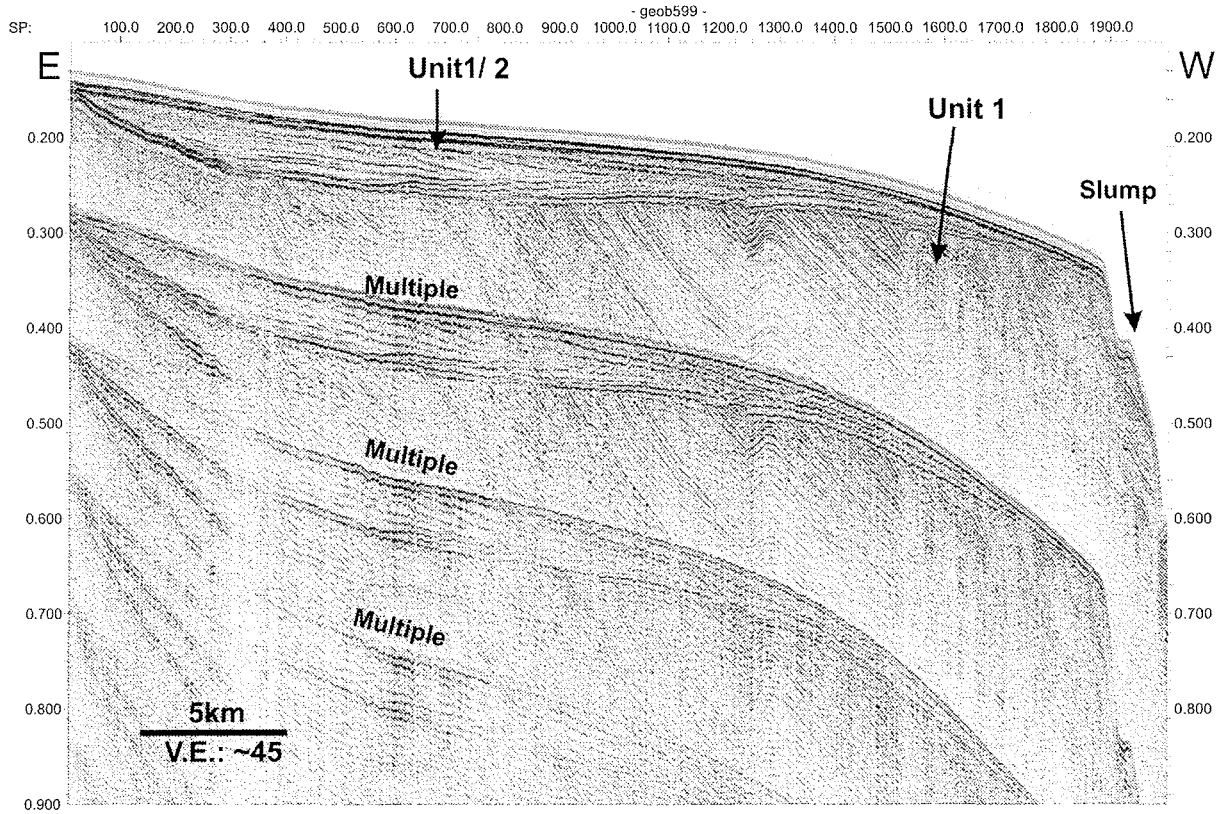


Fig. 4.2.24: Brute stack of Profile GeoB06-599. See Fig. 4.2.4 for location.

Profile GeoB06-559 (Fig. 4.2.25) runs in a North-South direction in the central survey area along the outer shelf. This profile can be separated in three units. The lower Unit (Unit 3) shows folded and faulted sediments with the same seismic facies as described for Line GeoB06-599 (se Fig. 4.2.24). The very pronounced fault in the central part of the profile indicates a strong segmentation of the older shelf sediments. Unit 2 is separated from Unit 3

by an erosional unconformity. The sediments of Unit 2 are imaged as medium to high amplitude reflectors with a relatively good continuity. Faults identified in Unit 3 reach into Unit 2. The sediments of Unit 2 are also partly folded, especially in the northern part of the profile. Unit 1 represents the uppermost sediments characterized by an almost transparent pattern though some very weak reflectors are visible. These reflectors onlap the sediments of Unit 2. The faults described for Unit 2 and 3 do not reach in the uppermost Unit 1. Unit 1 reaches a thickness of almost 50 m in the northern part of the profile but is almost absent in the southern part. As Profile GeoB06-599 (described above, see Fig. 4.2.24) crosses Profile GeoB06-559 (Fig. 4.2.25) in the southern part, Unit 1 and 2 cannot be separated on Line GeoB06-599. Unit 1 probably represents the Holocene, while the age of Unit 2 is unknown.

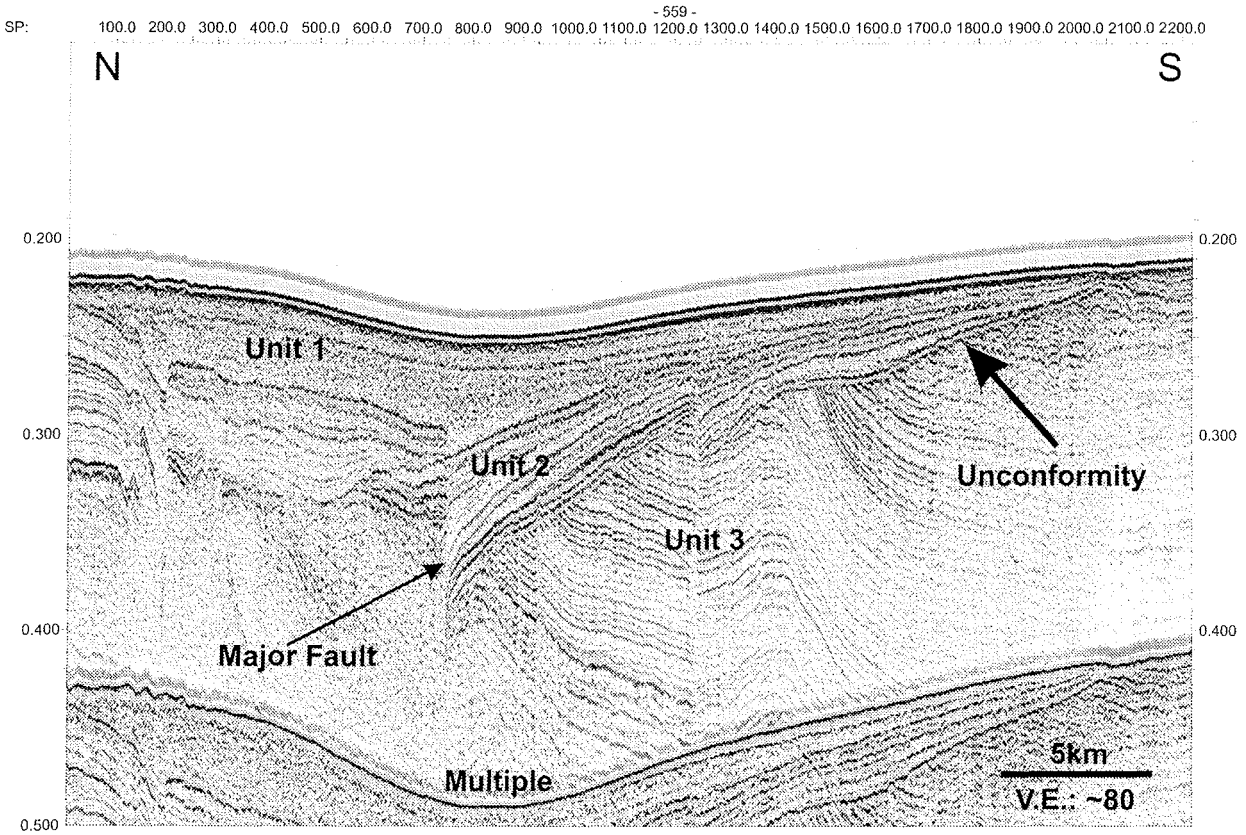


Fig. 4.2.25: Brute stack of Profile GeoB06-559. See Fig. 4.2.4 for location.

Profile GeoB06-604 shows a typical example of a seismic line in the southern survey area off Portugal (Fig. 4.2.26). The profile starts ~6 km off the coast at ~60 m water depth. Shelf width is ~40 km; the water depth at the shelf edge is ~180 m. The eastern part of the profile is characterized by inclined parallel reflectors of general good continuity, which are overlain by a very thin unit of parallel horizontally layered reflectors. The units are separated by an erosional unconformity. The western part of the profile shows an elevated rough seafloor with almost no penetration of the seismic signal. This area is interpreted by Días et al. (2002) as Mesozoic

and Cenozoic outcrops. The outcrops stick ~10 m out of the shelf sediments on this profile and therefore inhibit the direct export of sediments to the continental slope in the southern survey area. The belt of outcrops reaches up to ~42°05'N and is an almost continuous feature though a small gap exists at ~41°45'N.

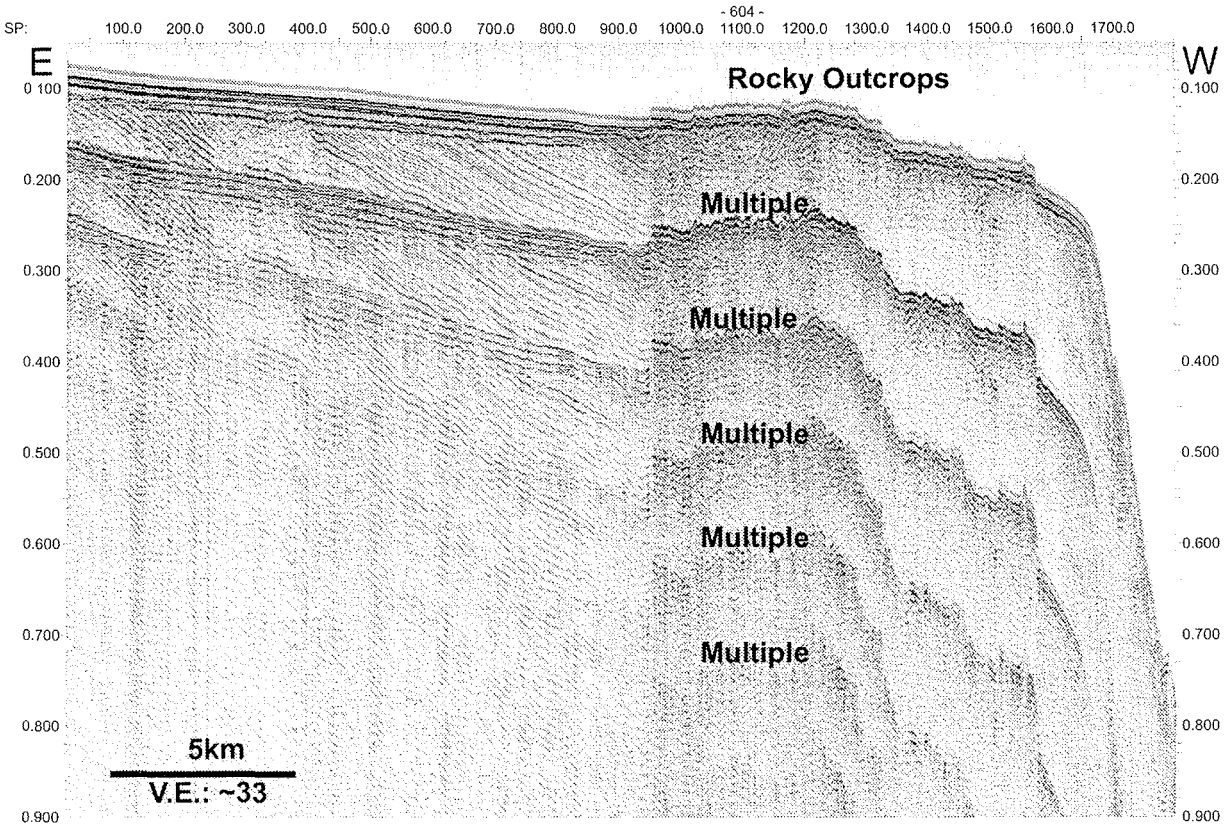


Fig. 4.2.26: Brute stack of Profile GeoB06-604. See Fig. 4.2.4 for location.

Several profiles collected on the shelf were continued to the continental margin in order to study the sediment export from the shelf to the continental margin. Profile GeoB06-565 (Fig. 4.2.27) is an example collected in the central survey area. The shelf edge is in a relatively large depth of ~375 m. The upper continental slope is extremely steep and reaches slope angles of up to 30° in water depths between 500 m and 1000 m. Slump deposits characterized by acoustic transparency are imaged at the toe of the steep slope. Other profiles also show slump deposits relatively close to the shelf edge (see Fig. 4.2.24). At water depths greater than 1400 m the slope gradient suddenly decreases and blocks of well stratified sediments can be seen on the profile (Fig. 4.2.27). A ~70 m deep and ~2 km wide channel is found at the western end of the profile around shot point 150. We do not know the direction of the channel but we speculate that this channel runs in a North-South direction and was probably formed by currents. The well stratified blocks on both sides of the channel might represent small contouritic bodies. The sediments beneath these bodies show a transparent to chaotic seismic

facies. Such a facies is typical for mass wasting deposits and demonstrates the importance of gravity driven sediment transport on the continental slope.

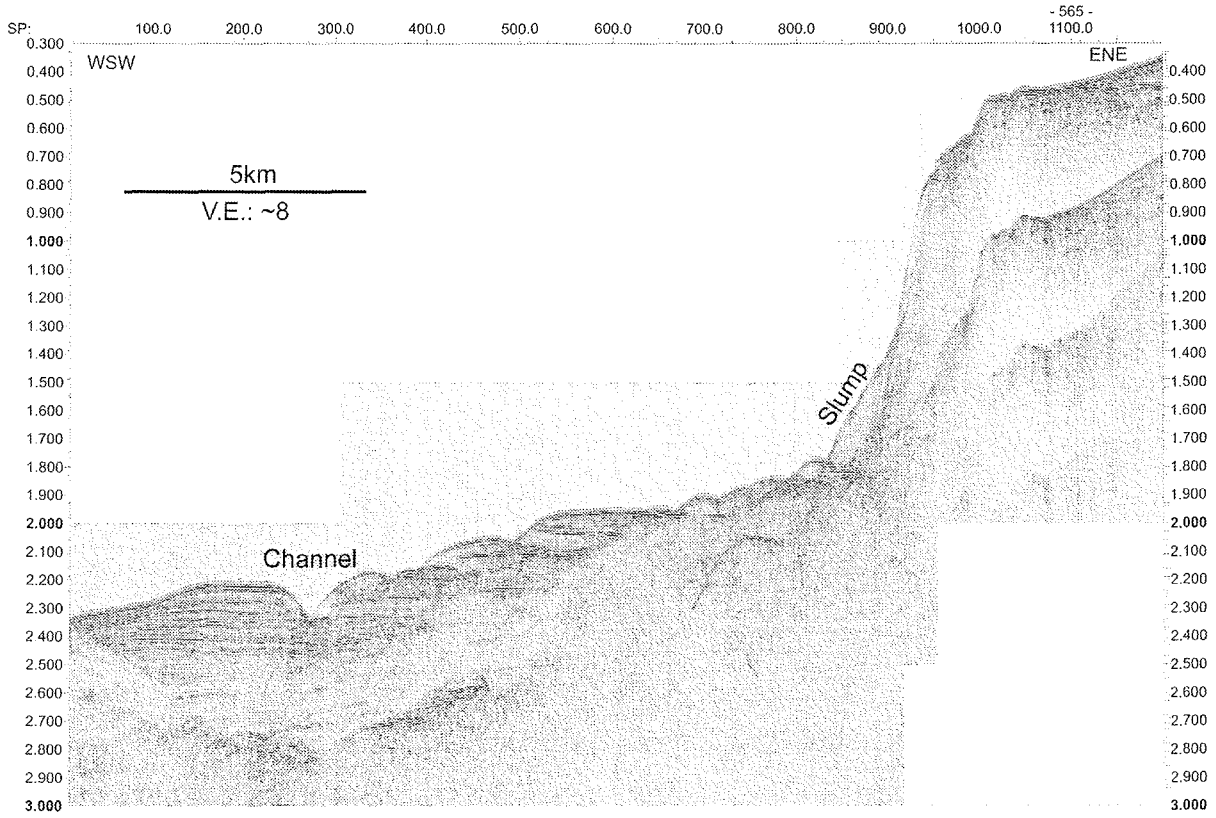


Fig. 4.2.7: Brute stack of Profile GeoB06-565. See Fig. 4.2.4 for location.

Table 4.2.1: List of Seismic Profiles

	Start					End				
Number of profile GeoB 06-	Date	Time UTC	Latitude north xx° xx.x'	Longitude west xx° xx.x'	Strata FFN	Date	Time UTC	Latitude north xx° xx.x'	Longitude west xx° xx.x'	Strata FFN
546	19.8.06	18:27	42°10,01	08°58,77	1413	19.8.06	23:17	42°10,00	09°29,96	3710
547	19.8.06	23:17	42°10,00	09°29,96	3710	19.8.06	23:57	42°12,88	09°29,60	4056
548	19.8.06	23:57	42°12.88	09°30.00	4014	20.8.06	4:26	42°17.10	09°03.03	6005
549	20.8.06	16:06	42°14.94	09°04.91	560	20.8.06	17:17	42°14.99	08°58.01	1091
550	20.8.06	17:20	42°15.22	08°58.15	1119	20.8.06	22:45	42°34,99	9°14,995	3573
551	20.8.06	22:45	42°34,99	9°14,995	3573	21.8.06	0:12	42°45,96	9°14,006	4676
552	21.8.06	1:12	42°45,96	9°14,006	4676	21.8.06	4:58	42°59,95	09°24,98	6375
553	21.8.06	4:58	42°59,95	09°24,98	6376	21.8.06	5:25	43°00,00	09°28,32	6575
554	21.8.06	5:29	42°59,99	09°28,32	6608	21.8.06	8:49	42°43,98	09°28,04	9050
555	21.8.06	8:53	42°43,88	09°28,27	9118	21.8.06	10:39	42°39,99	09°36,95	11470
556	21.8.06	10:39	42°39,99	09°36,95	11470	21.8.06	11:11	42°39,00	09°34,95	12117
557	21.8.06	11:11	42°39,00	09°34,95	12117	21.8.06	12:48	42°37,98	09°25,05	14235
558	21.8.06	12:48	42°37,98	09°25,05	14235	21.8.06	17:12	42°20,05	09°12,02	20175
559	21.8.06	17:12	42°20,05	09°12,02	20175	21.8.06	22:13	41°58,10	09°15,28	26933
560	21.8.06	22:16	41°57,99	09°15,11	26992	22.8.06	1:23	41°58,00	08°57,32	31192
561	22.8.06	1:27	41°58,22	08°57,14	31292	22.8.06	05:00	42°12,20	09°06,46	36086
562	22.8.06	17:39	42°11,24	09°05,85	45	22.8.06	20:07	42°19,99	09°12,06	3373
563	22.8.06	20:08	42°20,01	09°12,18	3408	23.8.06	00:42	42°23,61	09°38,01	8068
564	23.8.06	00:47	42°23,61	09°38,21	8106	23.8.06	01:29	42°26,61	09°38,30	8422
565	23.8.06	01:33	42°26,76	09°38,03	8451	23.8.06	06:25	42°32,13	09°09,52	13155
566	23.8.06	15:59	42°35,00	09°10,77	304	23.8.06	21:18	42°35,00	09°44,94	5488
567	23.8.06	21:21	42°35,11	09°45,02	5509	23.8.06	22:58	42°42,38	09°45,00	6240
568	23.8.06	23:01	42°42,51	09°44,77	6263	24.8.06	04:54	42°42,49	09°10,46	12781
569	24.8.06	13:58	42°52,71	09°19,20	692	24.8.06	18:14	42°52,72	09°42,91	6300
570	24.8.06	18:19	42°54,98	09°42,59	6388	24.8.06	21:09	43°03,97	09°41,01	7635
571	24.8.06	21:11	43°04,07	09°40,75	7661	25.8.06	0:35	43°06,31	09°20,63	1777
572	25.8.06	0:38	43°06,17	09°20,65	11857	25.8.06	01:29	43°02,40	09°20,28	13002
573	25.8.06	01:33	43°02,26	09°20,45	13090	25.8.06	04:16	43°01,61	09°35,92	16789
574	25.8.06	04:18	43°01,61	09°36.00	16790	25.8.06	05:31	42°56,65	09°35,99	18086
575	25.8.06	05:31	42°56,65	09°35,99	18087	25.8.06	07:28	42°56,49	09°25,29	20677
576	25.8.06	07:31	42°56,32	09°25,17	20755	25.8.06	09:01	42°49,11	09°25,05	22774
577	25.8.06	09:04	42°48,99	09°24,89	22832	25.8.06	11:07	42°48,98	09°13,37	25587
578	25.8.06	11:14	42°48,73	09°13,01	25753	25.8.06	11:54	42°46,30	09°12,99	26655
579	25.8.06	12:01	42°46,17	09°13,40	26815	25.8.06	16:41	42°46,18	09°37,89	33089
580	25.8.06	16:48	42°45,75	09°38,03	33224	25.8.06	19:53	42°32,09	09°38,01	35091
581	25.8.06	19:41	42°31,99	09°37,86	35114	25.8.06	20:37	42°32,02	09°32,65	35528
582	25.8.06	20:41	42°32,24	09°32,57	35559	25.8.06	23:27	42°43,88	09°32,58	38976
583	25.8.06	23:30	42°44,01	09°32,39	39055	26.8.06	00:11	42°44,47	09°28,42	39982
584	26.8.06	00:15	42°44,36	09°28,19	40064	26.8.06	01:48	42°37,97	09°24,89	42154
585	26.8.06	01:51	42°37,97	09°24,89	42220	26.8.06	04:55	42°37,98	09°07,59	46346
586	26.8.06	18:39	42°45,10	09°33,42	125	26.8.06	19:24	42°41,52	09°33,40	1153
587	26.8.06	19:27	42°41,49	09°33,18	1221	26.8.06	19:43	42°14,51	09°31,77	1556
588	26.8.06	19:43	42°14,51	09°31,77	1556	26.8.06	20:30	42°44,49	09°31,22	2618
589	26.8.06	20:30	42°44,49	09°31,22	2618	26.8.06	21:35	42°38,97	09°30,98	4092
590	26.8.06	21:35	42°38,97	09°30,98	4092	27.8.06	01:44	42°23,63	09°21,08	9600
591	27.8.06	01:48	42°23,55	09°20,80	9696	27.8.06	04:59	42°29,64	09°05,90	14000
592	27.8.06	14:19	42°26,86	09°38,16	18	27.8.06	18:44	42°19,99	10°03,77	2010
593	27.8.06	18:48	42°19,76	10°03,77	2035	27.8.06	20:57	42°10,89	10°03,75	3000
594	27.8.06	21:03	42°10,78	10°03,24	3051	28.8.06	03:00	42°10,04	09°29,83	5713
595	28.8.06	03:00	42°10,04	09°29,83	5714	28.8.06	08:54	42°26,40	09°03,59	13316
596	28.8.06	15:25	42°09,98	09°22,41	328	28.8.06	19:52	42°10,02	08°58,07	6323
597	28.8.06	19:57	42°10,31	08°58,00	6452	28.8.06	21:37	42°17,49	08°38,04	8705
598	28.8.06	21:51	42°17,51	08°59,38	9005	29.8.06	00:37	42°05,17	08°58,03	12751
599	29.8.06	00:42	42°04,95	08°58,26	12854	29.8.06	05:09	42°04,99	08°23,81	18787
600	29.8.06	14:03	42°06,28	09°01,47	546	29.8.06	16:16	41°56,82	09°05,79	3541
601	29.8.06	17:45	41°59,45	09°04,57	3773	30.8.06	00:24	41°30,10	09°03,00	12748
602	30.8.06	00:27	41°29,26	09°02,73	12812	30.8.06	02:29	42°30,01	08°52,62	15567
603	30.8.06	02:29	42°30,01	08°52,62	15568	30.8.06	03:09	41°32,99	08°52,55	16494
604	30.8.06	03:09	41°32,99	08°52,55	16494	30.8.06	7:50	41°33,02	09°19,9	22410
605	30.8.06	7:50	41°33,02	09°19,9	22410	30.8.06	09:01	41°37,96	09°19,98	22941
606	30.8.06	09:01	41°37,96	09°19,98	22941	30.8.06	12:57	41°37,96	08°58,10	28142
607	30.8.06	13:07	41°38,29	08°57,46	28357	30.8.06	14:13	41°42,94	08°57,41	29846
608	30.8.06	14:19	41°43,08	08°57,98	29960	30.8.06	19:02	41°43,00	09°20,49	36356
609	30.8.06	19:05	41°43,10	09°20,52	36410	30.8.06	21:22	41°47,96	09°20,97	39497
610	30.8.06	21:22	41°47,96	09°20,97	39497	31.8.06	02:19	41°48,00	08°57,10	3297
611	31.8.06	02:19	41°48,00	08°57,10	3298	31.8.06	03:26	41°53,07	08°57.03	5411
612	31.8.06	03:26	41°53,07	08°57,03	5412	31.8.06	5:00	41°53,04	09°06,22	7532
613	31.8.06	18:08	42°17,85	09°11,45	6	1.9.06	00:05	41°53,06	09°05,81	8034
614	1.9.06	00:17	41°53,03	09°05,86	8314	1.9.06	3:36	41°52,99	09°24,03	12825
615	1.9.06	3:36	41°52,99	09°24,03	12826	1.9.06	03:50	41°52,04	09°24,15	13109
616	1.9.06	03:50	41°52,04	09°24,15	13110	1.9.06	05:00	41°51,91	09°17,24	14680
617	1.9.06	15:59	41°41,99	09°04,85	721	1.9.06	18:35	41°42,47	09°20,02	4226
618	1.9.06	18:35	41°42,47	09°20,02	4226	1.9.06	19:00	41°44,00	09°19,45	4804
619	1.9.06	19:00	41°44,00	09°19,45	4804	1.9.06	21:24	41°44,01	09°05,06	8034
620	1.9.06	21:36	41°44,91	09°05,01	8307	1.9.06	23:54	41°44,99	09°19,82	11424
621	2.9.06	00:12	41°45,97	09°19,70	11817	2.9.06	02:35	41°46,01	09°04,98	15047
622	2.9.06	02:49	41°47,00	09°04,99	15387	2.9.06	05:11	41°47,01	09°19,88	18551
623	2.9.06	13:48	41°30,00	09°00,95	837	2.9.06	16:01	41°30,00	09°14,39	3832
624	2.9.06	16:01	41°30,00	09°14,39	3833	2.9.06	17:12	41°35,36	09°14,98	5461
625	2.9.06	17:12	41°35,36	09°14,98	5462	2.9.06	18:52	41°35,50	09°04,05	7689
626	2.9.06	18:52	41°35,50	09°04,05	7690	2.9.06	22:30	41°49,81	09°13,39	125823
627	2.9.06	22:33	41°50,00	09°07,11	12668	3.9.06	00:29	41°49,99	09°01,23	15264
628	3.9.06	00:33	41°50,14	09°00,99	15348	3.9.06	01:37	41°55,00	09°01,00	16792
629	3.9.06	01:41	41°55,00	09°01,24	16882	3.9.06	05:11	41°55,00	09°22,37	21638
630	3.9.06	05:14	41°55,12	09°22,42	21673	3.9.06	06:56	41°57,72	09°20,31	22623
631	3.9.06	16:52	41°47,72	09°19,75	260	3.9.06	21.10	41°49,99	09°43,62	2169
632	3.9.06	21:10	41°49,99	09°43,62	2169	4.8.06	00:28	41°36,14	09°43,75	3645
633	4.8.06	00:32	41°35,48	09°43,48	3680	4.8.06	05:57	41°34,89	09°12,36	6108

4.3 Sedimentology

(V. Bender, S. Bujan, T. Hanebuth, B. Kockisch, H. Lantzsch, Á. Mena Rodríguez)

4.3.1 Sediment Sampling Strategy

The cruise has covered different modern and ancient environmental settings. The modern environments include generally fine-grained deposits from the modern mud belt as well as from the lower portions of the continental slope; commonly coarse-grained deposits from the inner and outer shelf zones. Ancient environments comprise laterally shifted mud depocenters as well as extremely coarse-grained or over-consolidated deposits such as terrestrial, coastal or open shelf facies, including paleo-shorelines and tempestites.

Therefore, we have used the Giant Box Corer (*Großkastengreifer*) for sampling of surficial seafloor sediments and the Vibrocorer (*Vibrolot*) and Gravity Corer (*Schwerelot*) for deeper sediment penetration. In the following the different sampling strategies are briefly presented, the individual core descriptions are shown and a preliminary discussion of the first results is given.

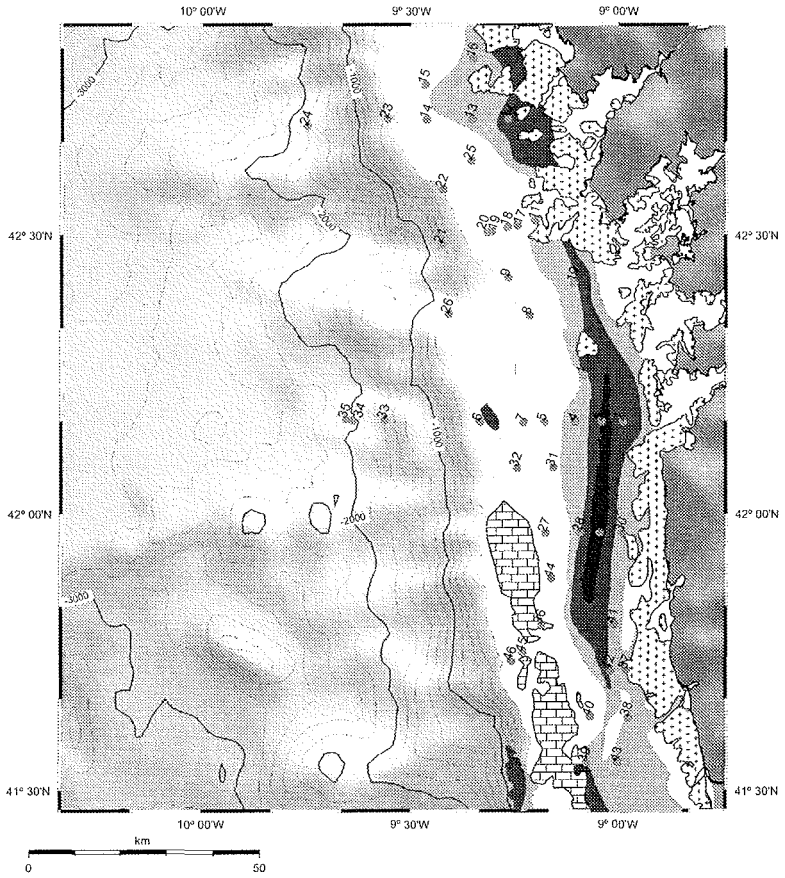


Fig. 4.3.1: Locations of cruise stations.

Tab. 4.3.1: List of all cruise stations

GeoB No.	Date 2006	Equip-ment	Time Sea floor (UTC)	Coordinates		Water Depth (m)	Recovery (m)
				Latitude	Longitude		
11001-1	20.08.2006		06:09	42°14'59,6''N	9°04'60,0''W	136	empty
11001-2	20.08.2006		06:31	42°14'59,6''N	9°04'60,0''W	136	
11001-3	20.08.2006	VC-5	08:10	42°15'00,1''N	9°05'00,6''W	136	1,14
11002-1	22.08.2006		06:14	42°09'59,7''N	8°59'24,4''W	111	
11002-2	22.08.2006	GC-3	06:35	42°10'00,6''N	8°59'24,9''W	111	2,52
11002-3	22.08.2006	VC-5	07:20	42°10'00,1''N	8°59'24,6''W	111	4,39
11003-1	22.08.2006		08:23	42°09'59,9''N	9°02'23,9''W	129	empty
11003-2	22.08.2006		08:41	42°09'59,9''N	9°02'23,9''W	129	
11003-3	22.08.2006	VC-5	09:08	42°10'00,6''N	9°02'24,5''W	129	4,54
11004-1	22.08.2006		10:05	42°09'59,9''N	9°06'17,4''W	141	
11004-2	22.08.2006	VC-5	10:37	42°10'00,3''N	9°06'17,5''W	141	3,5
11005-1	22.08.2006		11:46	42°10'00,1''N	9°10'51,1''W	161	
11005-2	22.08.2006	VC-5	12:10	42°10'00,2''N	9°10'50,1''W	161	3,21
11006-1	22.08.2006		13:57	42°10'00,0''N	9°20'01,2''W	234	
11006-2	22.08.2006	GC-3	14:27	42°10'00,6''N	9°20'01,4''W	235	0
11006-3	28.08.2006	GC-3	14:22	42°10'00,1''N	9°19'57,8''W	231	0
11006-4	28.08.2006	GC-3	14:40	42°10'01,7''N	9°20'01,9''W	232	0
11007-1	22.08.2006		15:34	42°09'59,2''N	9°13'49,3''W	184	
11007-2	22.08.2006	GC-6	16:00	42°09'59,5''N	9°13'49,2''W	183	3,2
11008-1	23.08.2006		08:11	42°21'30,0''N	9°12'58,3''W	157	
11008-2	23.08.2006	VC-5	08:39	42°21'29,4''N	9°13'00,1''W	157	3,77
11009-1	23.08.2006		10:10	42°25'29,4''N	9°15'59,4''W	166	
11009-2	23.08.2006	VC-5	10:42	42°25'29,4''N	9°16'00,0''W	166	1,67
11009-3	28.08.2006	VC-5	10:41	42°25'29,8''N	9°15'59,8''W	165	2,17
11010-1	23.08.2006		12:19	42°25'00,1''N	9°06'29,3''W	118	
11010-2	23.08.2006	VC-5	12:46	42°25'00,0''N	9°06'28,6''W	119	4,2
11011-1	23.08.2006		14:25	42°31'38,1''N	9°12'07,9''W	100	
11011-2	23.08.2006	VC-5	14:50	42°31'38,7''N	9°12'07,9''W	100	4,85
11012-1	24.08.2006		06:06	42°42'30,8''N	9°15'57,6''W	119	
11012-2	24.08.2006	VC-5	06:31	42°42'29,4''N	9°16'00,2''W	119	4,33
11013-1	24.08.2006		07:23	42°42'28,6''N	9°21'09,2''W	130	
11013-2	24.08.2006	VC-5	07:50	42°42'29,4''N	9°21'07,0''W	129	4,3
11014-1	24.08.2006		09:08	42°42'29,5''N	9°27'40,1''W	153	
11014-2	24.08.2006	VC-5	09:28	42°42'29,7''N	9°27'39,0''W	153	4,5
11015-1	24.08.2006		10:30	42°46'10,8''N	9°27'59,0''W	158	
11015-2	24.08.2006	VC-5	10:50	42°46'11,0''N	9°27'58,1''W	159	4,95
11016-1	24.08.2006		12:13	42°48'60,0''N	9°21'00,1''W	132	
11016-2	24.08.2006	VC-5	12:31	42°49'00,0''N	9°20'59,9''W	132	4,56
11017-1	26.08.2006		06:18	42°31'10,4''N	9°14'40,4''W	120	
11017-2	26.08.2006	VC-5	06:39	42°31'10,5''N	9°14'40,4''W	120	4,85
11018-1	26.08.2006		07:24	42°30'54,3''N	9°16'06,5''W	124	
11018-	27.08.2006	VC-5	06:35	42°30'54,6''N	9°16'04,8''W	125	4

GeoB No.	Date 2006	Equip ment	Time Sea floor (UTC)	Coordinates Latitude	Longitude	Water Depth (m)	Recovery (m)
11019-1	26.08.2006		08:00	42°30'28,8''N	9°18'18,0''W	147	
11019-2	27.08.2006	VC-5	07:45	42°30'28,4''N	9°18'16,2''W	149	4,49
11020-1	26.08.2006		08:27	42°30'23,0''N	9°18'55,2''W	154	
11020-2	27.08.2006	VC-5	09:17	42°30'22,7''N	9°18'52,5''W	154	3,92
11021-1	26.08.2006		09:37	42°29'08,5''N	9°25'31,5''W	484	
11021-2	26.08.2006	GC-3	10:05	42°29'07,8''N	9°25'32,6''W	487	0
11022-1	26.08.2006		11:24	42°34'59,6''N	9°25'17,2''W	289	
11022-2	26.08.2006	GC-3	11:41	42°34'59,2''N	9°25'17,6''W	292	0,32
11023-1	26.08.2006		13:26	42°42'29,7''N	9°33'25,9''W	405	
11023-2	26.08.2006	GC-3	13:45	42°42'30,3''N	9°33'25,3''W	403	0,28
11024-1	26.08.2006		15:35	42°41'46,8''N	9°45'37,2''W	1831	
11024-2	26.08.2006	GC-6	16:40	42°41'46,4''N	9°45'00,1''W	1823	1,1
11025-1	27.08.2006		11:28	42°38'03,8''N	9°21'18,8''W	131	
11025-2	27.08.2006	VC-5	11:45	42°38'03,9''N	9°21'18,6''W	131	
11026-1	28.08.2006		12:12	42°21'37,2''N	9°24'32,9''W	340	bended
11027-1	29.08.2006		07:00	41°57'59,8''N	9°10'37,4''W	137	
11027-2	29.08.2006	VC-5	07:20	41°57'59,9''N	9°10'34,9''W	136	4,55
11028-1	29.08.2006		08:18	41°58'00,1''N	9°05'32,2''W	127	
11028-2	29.08.2006	VC-5	08:35	41°57'59,9''N	9°05'29,6''W	127	4,52
11029-1	29.08.2006		09:20	41°57'59,8''N	9°02'45,2''W	115	
11029-2	29.08.2006	VC-5	09:36	41°57'59,9''N	9°02'42,3''W	114	4,9
11030-1	29.08.2006		11:05	41°57'59,8''N	8°59'23,9''W	94	
11030-2	29.08.2006	VC-5	11:23	41°58'00,0''N	8°59'24,1''W	94	4,4
11031-1	31.08.2006		06:48	42°05'02,6''N	9°09'27,1''W	149	
11031-2	31.08.2006	VC-5	7 :07	42°05'04,0''N	9°09'25,4''W	149	0
11031-3	03.09.2006	VC-5	09:40	42°05'04,3''N	9°09'25,3''W	148	1,98
11032-1	31.08.2006		08:03	42°05'05,5''N	9°14'42,9''W	166	
11033-1	31.08.2006		10:33	42°10'11,1''N	9°33'50,3''W	1873	
11033-2	31.08.2006	GC-6	11:23	42°10'11,5''N	9°33'49,7''W	1874	5,21
11034-1	31.08.2006	GC-6	13:13	42°10'10,3''N	9°38'28,1''W	1983	4,72
11034-1	31.08.2006		13:13	42°10'10,3''N	9°38'28,1''W	1983	
11035-1	31.08.2006	GC-6	14:31	42°10'17,8''N	9°39'28,0''W	2045	5,05
11035-1	31.08.2006		14:31	42°10'17,8''N	9°39'28,0''W	2045	
11036-1	01.09.2006		06:20	41°48'04,2''N	9°11'16,2''W	125	
11036-2	01.09.2006	VC-5	06:46	41°48'03,0''N	9°11'15,0''W	125	3,36
11037-1	01.09.2006		08:52	41°43'10,2''N	8°58'47,8''W	80	
11037-2	01.09.2006	VC-5	09:15	41°43'09,0''N	8°58'48,0''W	80	2,7
11038-1	01.09.2006		10:42	41°38'03,6''N	8°58'26,4''W	78	
11038-2	01.09.2006	VC-5	10:59	41°38'03,0''N	8°58'27,0''W	78	4,55
11039-1	01.09.2006		12:29	41°33'03,6''N	9°04'39,6''W	99	
11039-2	01.09.2006	VC-5	12:53	41°33'03,7''N	9°04'38,9''W	99	4,41
11039-3	04.09.2006	GC-6	07:31	41°33'05,9''N	9°04'38,3''W	99	2,09
11040-1	01.09.2006		14:15	41°38'04,2''N	9°04'03,0''W	99	
11040-2	01.09.2006	VC-5	14:33	41°38'04,4''N	9°04'02,4''W	98	4,92
11041-1	02.09.2006		07:29	41°38'04,7''N	9°00'38,3''W	93	

GeoB No.	Date 2006	Equip ment	Time Sea floor (UTC)	Coordinates Latitude	Longitude	Water Depth (m)	Recovery (m)
11041-2	02.09.2006	VC-5	07:48	41°48'04,9''N	9°00'36,6''W	93	4,79
11042-1	02.09.2006		08:55	41°43'03,0''N	9°01'08,4''W	95	
11042-2	02.09.2006	VC-5	09:13	41°43'03,7''N	9°01'07,2''W	96	4,51
11043-1	02.09.2006		11:14	41°33'05,2''N	9°00'02,9''W	84	
11043-2	02.09.2006	VC-5	11:30	41°33'05,6''N	9°00'03,2''W	84	4,51
11044-1	03.09.2006		11:59	41°53'05,7''N	9°09'41,7''W	126	
11045-1	03.09.2006		13:31	41°45'02,1''N	9°13'51,3''W	129	
11046-1	03.09.2006		14:11	41°44'03,8''N	9°15'27,3''W	142	

4.3.2 Seabed Sampling with the Giant Box Corer

The Giant Box Corer has an edge length of 50 cm and a maximum seabed penetration depth of 50 cm. This corer was applied as first tool on all of the stations to provide an amount of surface material sufficiently enough for the different involved research groups. As well, the decision which type of corer should be used subsequently was made on this first impression to receive cored material in best-possible quality later on.

After arriving on deck, the over-standing water was removed and the sediment surface was documented by a brief description and photography. Then, liners were pressed in and surfaces samples were taken. Finally, the front wall was opened and the downcore profile was described, photographed and sampled.

The original Giant Box Core descriptions are attached in the Appendix.

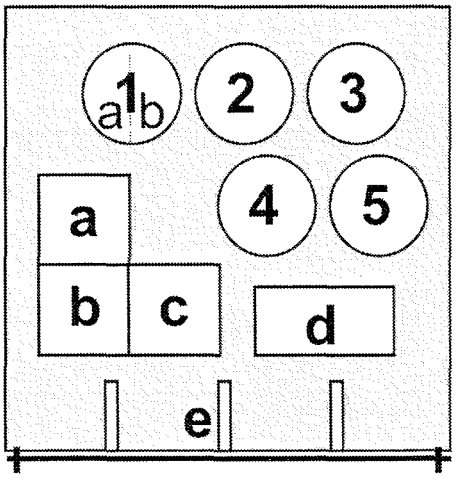
Tab. 4.2.3: List of GIANT BOX CORER stations.

GeoB	Date	UTC Seafloor	Coordinates Latitude	Longitude	Water depth (m)	Recovery & Sampling	Remarks
11001-1	20.08.2006	06:09	42°14'59,6''N	9°04'60,0''W	136		empty
11001-2	20.08.2006	06:31	42°14'59,6''N	9°04'60,0''W	136	34cm, 4xL, 4xSurface, pore water	
11002-1	22.08.2006	06:14	42°09'59,7''N	8°59'24,4''W	111	32 cm, 4xL, 4xSurface, pore water	
11003-1	22.08.2006	08:23	42°09'59,9''N	9°02'23,9''W	129		empty
11003-2	22.08.2006	08:41	42°09'59,9''N	9°02'23,9''W	129	41 cm, 3xL, 3xSurface	
11004-1	22.08.2006	10:05	42°09'59,9''N	9°06'17,4''W	141	34 cm, 3xL, 3xSurface	

11005-1	22.08.2006	11:46	42°10'00,1''N	9°10'51,1''W	161	23 cm, 3xL, 3xSurface	
11006-1	22.08.2006	13:57	42°10'00,0''N	9°20'01,2''W	234	26 cm, 3xL, 3xSurface, pore water	
11007-1	22.08.2006	15:34	42°09'59,2''N	9°13'49,3''W	184	25 cm, 3xL, 3xSurface	
11008-1	23.08.2006	08:11	42°21'30,0''N	9°12'58,3''W	157	28 cm, 3xL, 3xSurface, pore water	
11009-1	23.08.2006	10:10	42°25'29,4''N	9°15'59,4''W	166	34 cm, 3xL, 3xSurface, pore water	
11010-1	23.08.2006	12:19	42°25'00,1''N	9°06'29,3''W	118	40 cm, 3xL, 3xSurface, pore water	
11011-1	23.08.2006	14:25	42°31'38,1''N	9°12'07,9''W	100	25 cm, 4xL, 4xSurface, pore water	
11012-1	24.08.2006	06:06	42°42'30,8''N	9°15'57,6''W	119	39 cm, 4xL, 4xSurface, pore water	
11013-1	24.08.2006	07:23	42°42'28,6''N	9°21'09,2''W	130	31 cm, 4xL, 4xSurface	
11014-1	24.08.2006	09:08	42°42'29,5''N	9°27'40,1''W	153	32 cm, 4xL, 4xSurface, pore water	
11015-1	24.08.2006	10:30	42°46'10,8''N	9°27'59,0''W	158	37 cm, 4xL, 4xSurface	
11016-1	24.08.2006	12:13	42°48'60,0''N	9°21'00,1''W	132	26 cm, 3xL, 3xSurface, pore water	
11017-1	26.08.2006	06:18	42°31'10,4''N	9°14'40,4''W	120	27 cm, 3xL, 3xSurface	
11018-1	26.08.2006	07:24	42°30'54,3''N	9°16'06,5''W	124	21 cm, 3xL, 3xSurface, pore water	
11019-1	26.08.2006	08:00	42°30'28,8''N	9°18'18,0''W	147	28 cm, 3xL, 3xSurface	
11020-1	26.08.2006	08:27	42°30'23,0''N	9°18'55,2''W	154	29 cm, 4xL, 4xSurface	
11021-1	26.08.2006	09:37	42°29'08,5''N	9°25'31,5''W	484	30 cm, 4xL, 4xSurface, pore water	
11022-1	26.08.2006	11:24	42°34'59,6''N	9°25'17,2''W	289	38 cm, 4xL, 4xSurface, pore water	
11023-1	26.08.2006	13:26	42°42'29,7''N	9°33'25,9''W	405	33 cm, 4xL, 4xSurface, pore water	
11024-1	26.08.2006	15:35	42°41'46,8''N	9°45'37,2''W	1831	32 cm, 4xL, 4xSurface, pore water	
11025-1	27.08.2006	11:28	42°38'03,8''N	9°21'18,8''W	131	33 cm, 3xL, 3xSurface	
11026-1	28.08.2006	12:12	42°21'37,2''N	9°24'32,9''W	340		GBC bended
11027-1	29.08.2006	07:00	41°57'59,8''N	9°10'37,4''W	137	27 cm, 4xL, 4xSurface, pore water	
11028-1	29.08.2006	08:18	41°58'00,1''N	9°05'32,2''W	127	44 cm, 4xL, 4xSurface,	
11029-1	29.08.2006	09:20	41°57'59,8''N	9°02'45,2''W	115	38 cm, 4xL, 4xSurface	
11030-1	29.08.2006	11:05	41°57'59,8''N	8°59'23,9''W	94	30cm, 4xL, 4xSurface, pore water	
11031-1	31.08.2006	06:48	42°05'02,6''N	9°09'27,1''W	149	29cm, 3xL, 3xSurface	

11032-1	31.08.2006	08:03	42°05'05,5''N	9°14'42,9''W	166	26cm, 3xL, 2xSurface	
11033-1	31.08.2006	10:33	42°10'11,1''N	9°33'50,3''W	1873	32cm, 4xL, 4xSurface, pore water	
11034-1	31.08.2006	13:13	42°10'10,3''N	9°38'28,1''W	1983	34 cm, 4xL, 4xSurface, pore water	
11035-1	31.08.2006	14:31	42°10'17,8''N	9°39'28,0''W	2045	4xL, 4xSurface, pore water	
11036-1	01.09.2006	06:20	41°48'04,2''N	9°11'16,2''W	125	22cm, 3xL, 2xSurface	
11037-1	01.09.2006	08:52	41°43'10,2''N	8°58'47,8''W	80	18cm, 4xL, 3xSurface,	
11038-1	01.09.2006	10:42	41°38'03,6''N	8°58'26,4''W	78	28cm, 3xL, 2xSurface,	
11039-1	01.09.2006	12:29	41°33'03,6''N	9°04'39,6''W	99	42cm, 4xL, 4xSurface, pore water	
11040-1	01.09.2006	14:15	41°38'04,2''N	9°04'03,0''W	99	24cm, 4xL, 3xSurface,	
11041-1	02.09.2006	07:29	41°38'04,7''N	9°00'38,3''W	93	33cm, 4xL, 4xSurface, pore water	
11042-1	02.09.2006	08:55	41°43'03,0''N	9°01'08,4''W	95	36cm, 4xL, 4xSurface, pore water	
11043-1	02.09.2006	11:14	41°33'05,2''N	9°00'02,9''W	84	23cm, 4xL, 3xSurface,	
11044-1	03.09.2006	11:59	41°53'05,7''N	9°09'41,7''W	126	26cm, 3xL, 2xSurface,	
11045-1	03.09.2006	13:31	41°45'02,1''N	9°13'51,3''W	129	17cm, 3xL, 2xSurface,	
11046-1	03.09.2006	14:11	41°44'03,8''N	9°15'27,3''W	142	20cm, 3xL, 2xSurface,	

Generally, the following standard scheme was applied for Giant Box Corer sampling.



Surface sampling:

a Paleoceanography 10x 10 (+ 4° C cooled)
b Forams 10 x 10 + Bengal Rose (for F. Abrantes)
c Forams 10 x 10 + Bengal Rose (for F. Abrantes)
d Sedimentology (S. Bujan)

e Pore water via Rhizones 50 ml (F. Schmidt)

Liner sampling:

1a Core description, radiography
1b Sedimentology (S. Bujan)
2 GeoB archive
3 Organics (deep freezer)
4 Micropaleontology (for F. Abrantes)
5 Pore water sampling (F. Schmidt)

Fig. 4.3.2: Sampling scheme for Giant Box Cores.

4.3.3 Sampling with Vibrocorer and Gravity Corer

During the cruise P-342, 43 sediment cores from 46 stations were recovered using the Vibrocorer VC-5, and the Gravity Corers GC-6 and GC-3 (Tab 4.3.1).

A Vibrocorer of the make VKG-6 (Schmidt, Rostock) was of essential use during this cruise to obtain subbottom samples from this storm-dominated shelf to retrieve coarse-grained material or fine-grained sediment with interbedded coarse layers, e.g. paleo-coastal deposits, thick shell horizons or paleosols. The Vibrocorer has a maximum core length of 500 cm and a diameter of 10 cm. With the 200-m long electricity cable, which is run parallel to the wire by hand, coring in a maximum water depth of 180 m was possible during calm wave conditions.

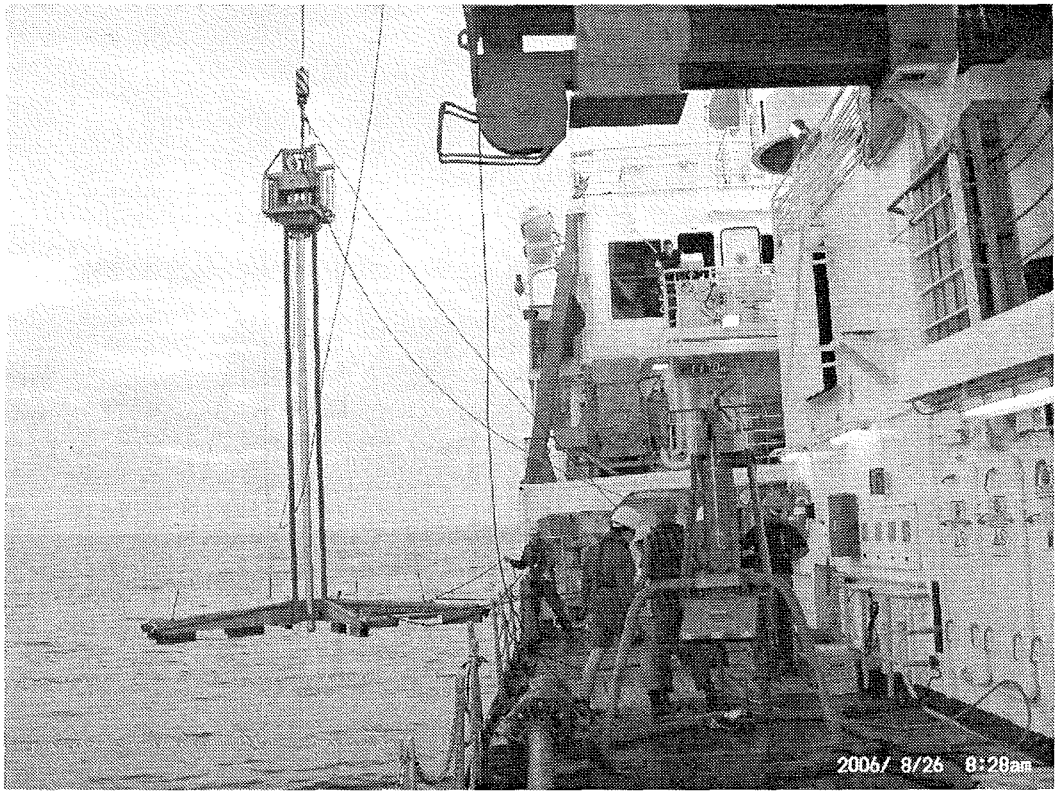


Fig. 4.3.3: The Vibrocorer in action.

Once a core was on deck, its plastic liners were cut into 1 m segments, closed with caps and labeled according the scheme generally applied to GeoB cores. After cutting the segments into work and archive halfs, the archive half was described, photographed and the physical properties were measured. Geochemical samples were taken from the work half part of some cores in intervals of 20 cm. A number of cores was opened in the Faculty of Geosciences, Bremen, for the first time due to the dense time schedule and room limitations on board.

A Gravity Corer with a top weight of 1.5 tons was in use only when either the water depth has exceeded the Vibrocorer limit, i.e. 180 m, or in fine and soft sediments such as in the mud belts and at the lower continental slope. Two lengths were available: a 3-m long tool for coarser seafloor material and a 6-m long tool for fine-and-soft sediment coring.

Tab. 4.3.4: List of VIBROCORER and GRAVITY CORER stations.

GeoB	Date 2006	Corer	UTC Sea floor	Coordinates		Water Depth (m)	Recovery (m)	Remarks
				Latitude	Longitude			
11001-3	20.08.	VC-5	8:10	42°15'00,1"N	9°05'00,6"W	136	1,14	see core description
11002-2	22.08.	GC-3	6:35	42°10'00,6"N	8°59'24,9"W	111	2,52	
11002-3	22.08.	VC-5	7:20	42°10'00,1"N	8°59'24,6"W	111	4,39	
11003-3	22.08.	VC-5	9:08	42°10'00,6"N	9°02'24,5"W	129	4,54	see core description
11004-2	22.08.	VC-5	10:37	42°10'00,3"N	9°06'17,5"W	141	3,50	
11005-2	22.08.	VC-5	12:10	42°10'00,2"N	9°10'50,1"W	161	3,21	
11006-2	22.08.	GC-3	14:27	42°10'00,6"N	9°20'01,4"W	235	-	empty
11006-3	28.08.	GC-3	14:22	42°10'00,1"N	9°19'57,8"W	231	-	empty
11006-4	28.08.	GC-3	14:40	42°10'01,7"N	9°20'01,9"W	232	-	empty
11007-2	22.08.	GC-6	16:00	42°09'59,5"N	9°13'49,2"W	183	3,20	
11008-2	23.08.	VC-5	8:39	42°21'29,4"N	9°13'00,1"W	157	3,77	
11009-2	23.08.	VC-5	10:42	42°25'29,4"N	9°16'00,0"W	166	1,40	
11009-3	28.08.	VC-5	10:41	42°25'29,8"N	9°15'59,8"W	165	2,17	
11010-2	23.08.	VC-5	12:46	42°25'00,0"N	9°06'28,6"W	119	4,20	
11011-2	23.08.	VC-5	14:50	42°31'38,7"N	9°12'07,9"W	100	4,85	
11012-2	24.08.	VC-5	6:31	42°42'29,4"N	9°16'00,2"W	119	4,33	
11013-2	24.08.	VC-5	7:50	42°42'29,4"N	9°21'07,0"W	129	4,30	
11014-2	24.08.	VC-5	9:28	42°42'29,7"N	9°27'39,0"W	153	4,50	
11015-2	24.08.	VC-5	10:50	42°46'11,0"N	9°27'58,1"W	159	4,95	see core description
11016-2	24.08.	VC-5	12:31	42°49'00,0"N	9°20'59,9"W	132	4,56	see core description
11017-2	26.08.	VC-5	6:39	42°31'10,5"N	9°14'40,4"W	120	4,85	
11018-2	27.08.	VC-5	6:35	42°30'54,6"N	9°16'04,8"W	125	4,00	
11019-2	27.08.	VC-5	7:45	42°30'28,4"N	9°18'16,2"W	149	4,49	
11020-2	27.08.	VC-5	9:17	42°30'22,7"N	9°18'52,5"W	154		
11021-2	26.08.	GC-3	10:05	42°29'07,8"N	9°25'32,6"W	487	-	empty
11022-2	26.08.	GC-3	11:41	42°34'59,2"N	9°25'17,6"W	292	0,32	see core description
11023-2	26.08.	GC-3	13:45	42°42'30,3"N	9°33'25,3"W	403		

11024-2	26.08.	GC-6	16:40	42°41'46,4"N	9°45'00,1"W	1823	1,10	
11025-2	27.08.	VC-5	11:50	42°38'03,9"N	9°21'17,7"W	131		
11027-2	29.08.	VC-5	7:20	41°57'59,9"N	9°10'34,9"W	136	4,55	
11028-2	29.08.	VC-5	8:35	41°57'59,9"N	9°05'29,6"W	127	4,52	
11029-2	29.08.	VC-5	9:36	41°57'59,9"N	9°02'42,3"W	114	4,90	
11030-2	29.08.	VC-5	11:23	41°58'00,0"N	8°59'24,1"W	94	4,40	
11031-2	31.08.	VC-5	7 :07	42°05'04,0"N	9°09'25,4"W	149	-	empty
11033-2	31.08.	GC-6	11:23	42°10'11,5"N	9°33'49,7"W	1,874	5,21	
11034-1	31.08.	GC-6	13:13	42°10'10,3"N	9°38'28,1"W	1,983	4,72	
11035-1	31.08.	GC-6	14:35	42°10'17,8"N	9°39'28,0"W	2,045	5,05	
11036-2	01.09.	VC-5	06:46	41°48'03,0"N	9°11'15,0"W	125	3,36	
11037-2	01.09.	VC-5	09:15	41°43'09,0"N	8°58'48,0"W	80	2,7	
11038-2	01.09.	VC-5	10:59	41°38'03,0"N	8°58'27,0"W	78	4,55	
11039-2	01.09.	VC-5	12:53	41°33'03,7"N	9°04'38,9"W	99	4,41	
11039-3	04.09.	GC-6	07:31	41°33'05,9"N	9°04'38,3"W	99	2,09	
11040-2	01.09.	VC-5	14:33	41°38'04,4"N	9°04'02,4"W	98	4,92	
11041-2	02.09.	VC-5	07:48	41°48'04,9"N	9°00'36,6"W	93	4,79	
11042-2	02.09.	VC-5	09:13	41°43'03,7"N	9°01'07,2"W	96	4,51	
11043-2	02.09.	VC-5	11:30	41°33'05,6"N	9°00'03,2"W	84	4,51	

For a better understanding and reproduction of the motivation why an individual core location was chosen, the following list summarizes i) a brief description of the local conditions based on Boomer data, and ii) refers to the special characteristics we have expected from that place. It should be mentioned that a core has penetrated strata beneath the surficial sediment unit probably only in rare cases.

GeoB	Position selected
11001	Test station at the margin of mud belt
11002	central mud belt position, two layered internal structure
11003	marginal mud belt position, double-layer pinching out
11004	thin and patchy surficial sediment sheet with strong foresets below
11005	Limit-of-VC position, thick deltaic wedge below very thin surficial sediment sheet
11006	foresets structures in older sediment wedge without young sediment sheet
11007	thinning of older sediment wedge (seismic), thin young sediment sheet disconnected from modern mud belt
11008	outer shelf position
11009	outer shelf position
11010	inner shelf position
11011	center of "inner mud belt"
11012	center of mud belt
11013	thin surficial sediment sheet in marginal position of "mud belt", constructed of two horizons, upper one very thin
11014	local tiny sediment patch at the shelf edge, thick shelf-break sediment wedge beneath
11015	outer shelf position
11016	marginal mud belt
11017	mud belt at relatively thin position + internal reflector
11018	center of "outer mud belt"
11019	very marginal to the "outer (older) mud belt"
11020	pure outer shelf with older strata on surface
11021	small sediment pocket on deeper part of shelf break
11022	blank seafloor on inner part of shelf break
11023	blank seafloor on deeper part of shelf break
11024	"slide mass" at the lower slope
11025	
11026	blank seafloor on the uppermost continental slope
11027	older sediment wedge (as extend of local sediment wedge) close to the rock barriere
11028	out-pinching of modern mud belt and thin older sediment wedge beneath, sedimentary "basement" at the base?
11029	central mud belt position, layered internal structure
11030	innermost part of modern mud belt, local older sediment wedge on rocky elevation beneath
11031	mid-shelf position, older sediment wedge
11032	outer-shelf position, older sediment wedge with deeper internal horizons
11033	stratified sediment body at slope as "slide mass"?
11034	stratified deep-sea sediments from a moat's levee
11035	stratified deep-sea sediments from open slope plain
11036	at the marginal part of an older sediment wedge with internal strata, stopped by the rock barriere
11037	blank seafloor (gravel) between rock outcrops on landside and modern mud patch on seaside
11038	marginal of modern mud patch with two internal horizons, older sediment wedge beneath
11039	marginal part of older sediment wedge, trapped by rock barriere, steeply declining old strata beneath
11040	thin isolated/local younger sediment sheet on the outer shelf, older sediment wedge beneath with dipping strata
11041	at marginal out-pinching seaside of modern mud belt
11042	at marginal out-pinching landward side of modern? mud belt with two to three internal horizons
11043	at marginal out-pinching seaside of modern mud belt

GeoB		Reason for selection
11001	N of Profile C	transition of mud belt to open shelf conditions
11002	Profile C	development of mud belt and internal stratification
11003	Profile C	marginal transition of mud belt and internal stratification
11004	Profile C	extend of modern mud belt or abandon sediment patch?
11005	Profile C	the sediment wedge beneath the modern mud belt
11006	Profile C	the sediment wedge beneath the modern mud belt
11007	Profile C	looks like an abandon mud belt
11008		intermediate position between profiles to trace the sediment path
11009		intermediate position between profiles to trace the sediment path
11010		intermediate position between profiles to trace the sediment path
11011	Profile B	difference of inner and outer parts of mud belt
11012	Profile A	development of mud belt
11013	Profile A	internal stratification of mud belt
11014	Profile A	modern or abondon sediment sheet?
11015		northernmost position to trace the export path
11016		northernmost position to trace the export path
11017	Profile B	mud belt extend + internal stratification
11018	Profile B	difference of inner and outer parts of mud belt
11019	Profile B	transition from mud belt to open-shelf conditions + transect from inner to outer shelf conditions
11020	Profile B	outer-shelf conditions + transect from inner to outer shelf conditions
11021	Profile B	is there modern sedimentation?
11022		is there modern sedimentation?
11023	Profile A	is there modern sedimentation?
11024		final sink of exported sediments
11025		intermediate position on outer shelf to trace the sediment transport path
11026		is there modern sedimentation?
11027	Profile D	development and relation of two thin sediment bodies
11028	Profile D	development and relation of two thin sediment bodies
11029	Profile D	development and relation of two thin sediment bodies
11030	Profile D	development and relation of two thin sediment bodies
11031		intermediate position to trace the lateral sediment distribution
11032		intermediate position to trace the lateral sediment distribution
11033		reference record + slope instability?
11034		reference record from moat or deep acting as sediment pocket?
11035		reference record from "sediment drift body"
11036		suggested transport (export) route of sediments around the northern edge of the rock barrier
11037		what characterizes the seafloor (in terms of transport processes) landward of the modern mud belt?
11038		development of southern end of mud belt and internal stratification
11039		influence of rock barriere on sedimentation
11040		difference of isolated sediment patches from the modern mud belt facies
11041		intermediate position to trace the lateral sediment distribution within the mud belt + internal stratification
11042		transition of mud belt to inner-shelf conditions + internal stratification
11043		southern development of mud belt + impression of deeper sediment wedge

Vibrocore and Gravity Core descriptions:

structures

S weak bioturbation
SS moderate bioturbation
SSS strong bioturbation

quartz grains
rock/rock fragment
fining-upwards
concretion
organic/monosulfide spot

burrow/open worm tube
bone
root/plant debris
gastropod
bivalve
shell fragments
aligned bivalve (concave/convex upward)
complete bivalve
scaphopod
coral
echinoderm fragments
bryozoan
serpulid
pteropod
glauconite
mica
slump structure
water escape structure
mud lens
sand lens
silt lens

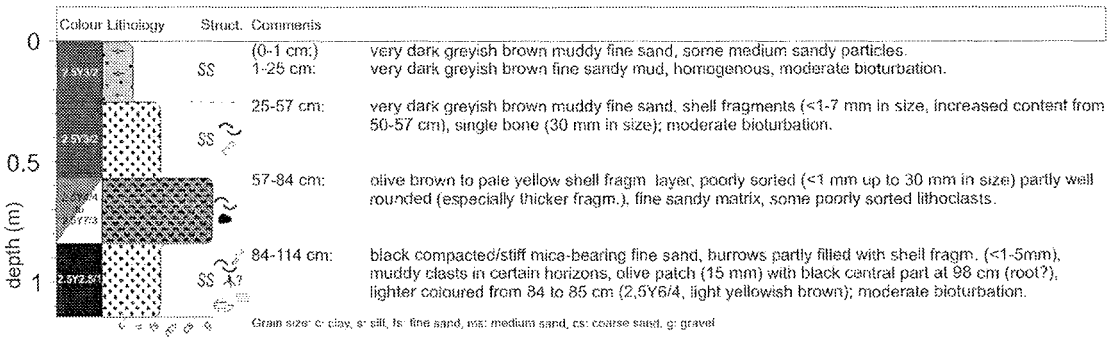
very angular
angular
sub-angular
sub-rounded
rounded
well rounded

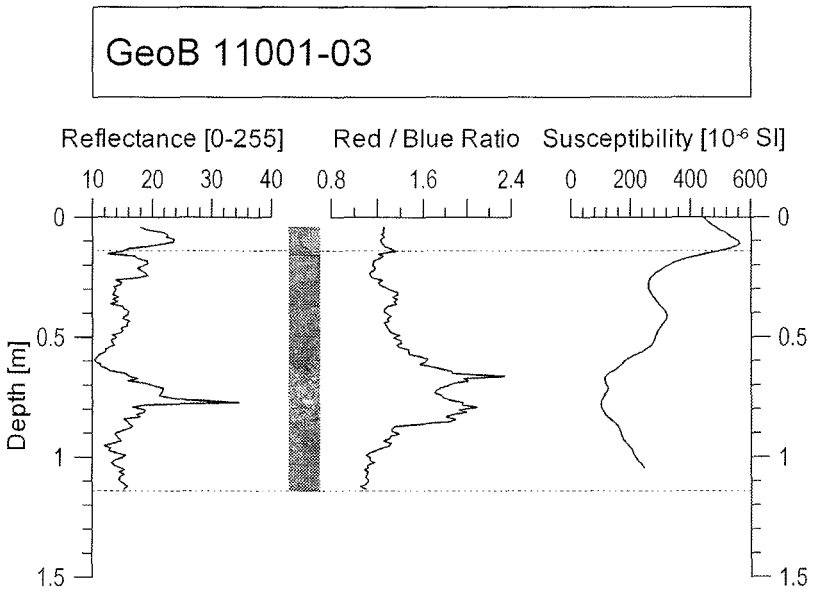
gastropod

sharp boundary
unclear/gradual boundary
angled boundary
erosive boundary
bioturbated boundary

GeoB 11001-3$_{VC}$

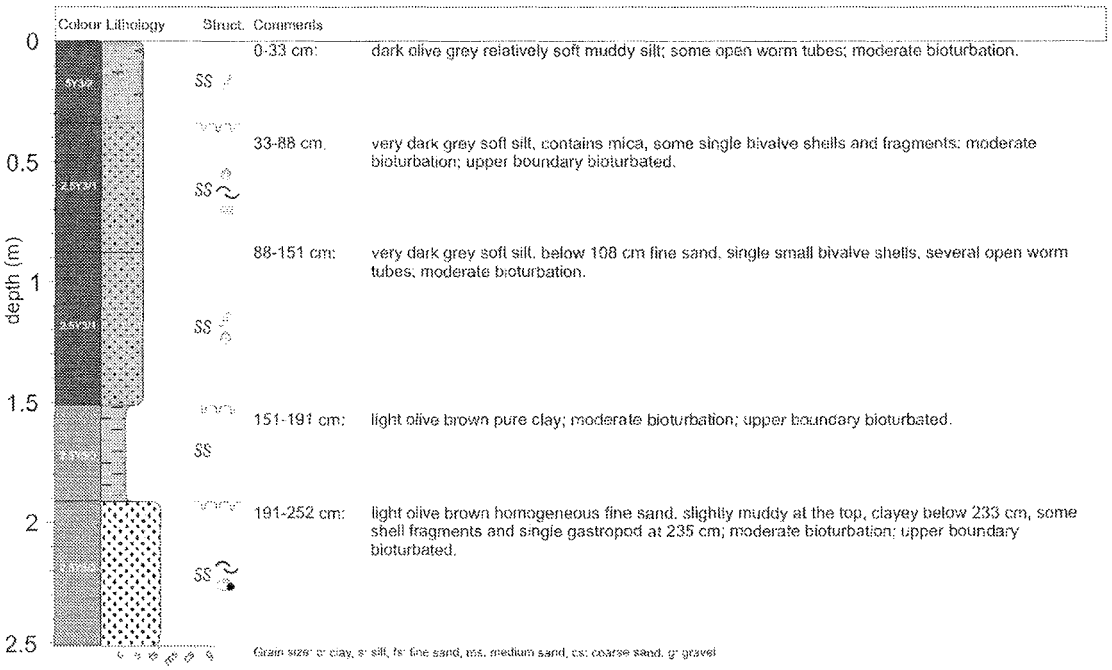
Date: 20.08.06 Pos: 42°15'00"N 9°05'00"W
Water depth: 136 m Core length: 114 cm

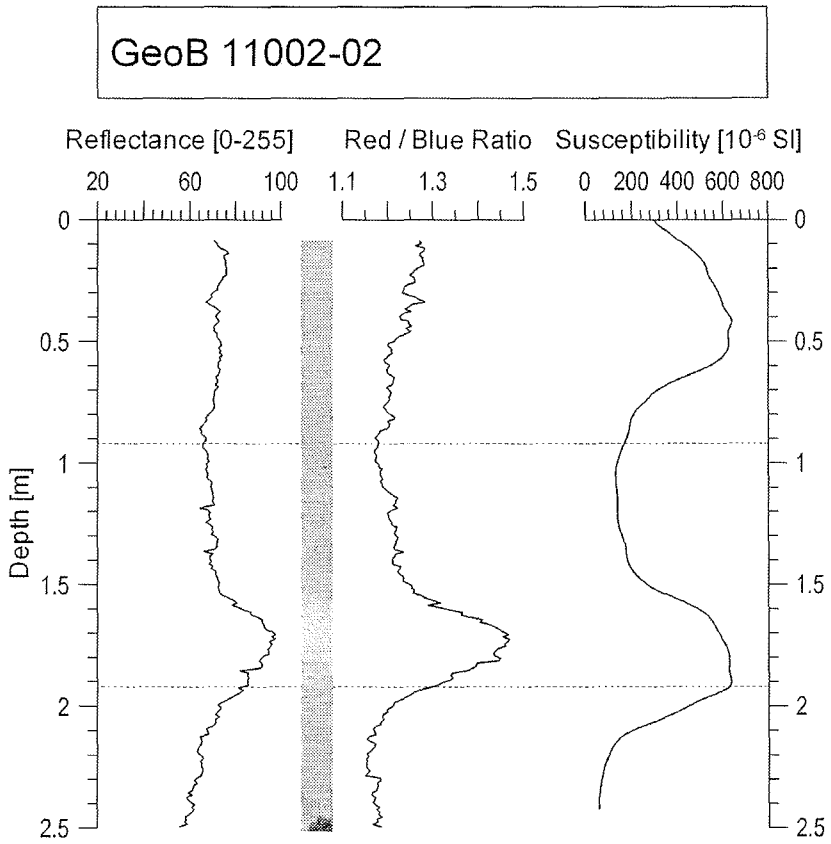



GeoB 11001-03
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
10 20 30 40
0.8 1.6 2.4
0 200 400 600
Depth [m]
0
0.5
1
1.5

GeoB 11002-2$_{GC}$

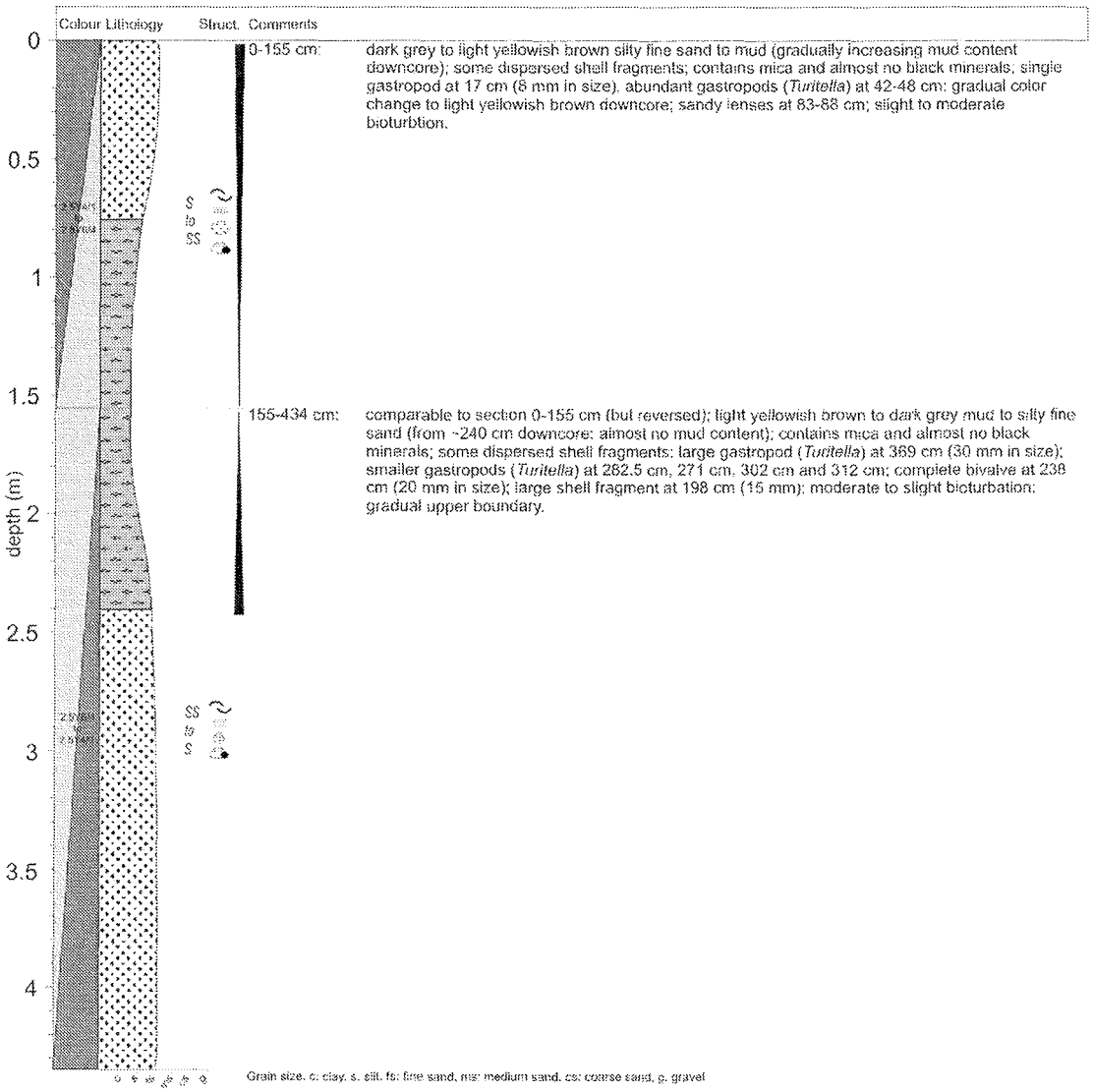
Date: 22.08.06 Pos: 42°10'00"N 8°59'25"W
Water depth: 111 m Core length: 252 cm

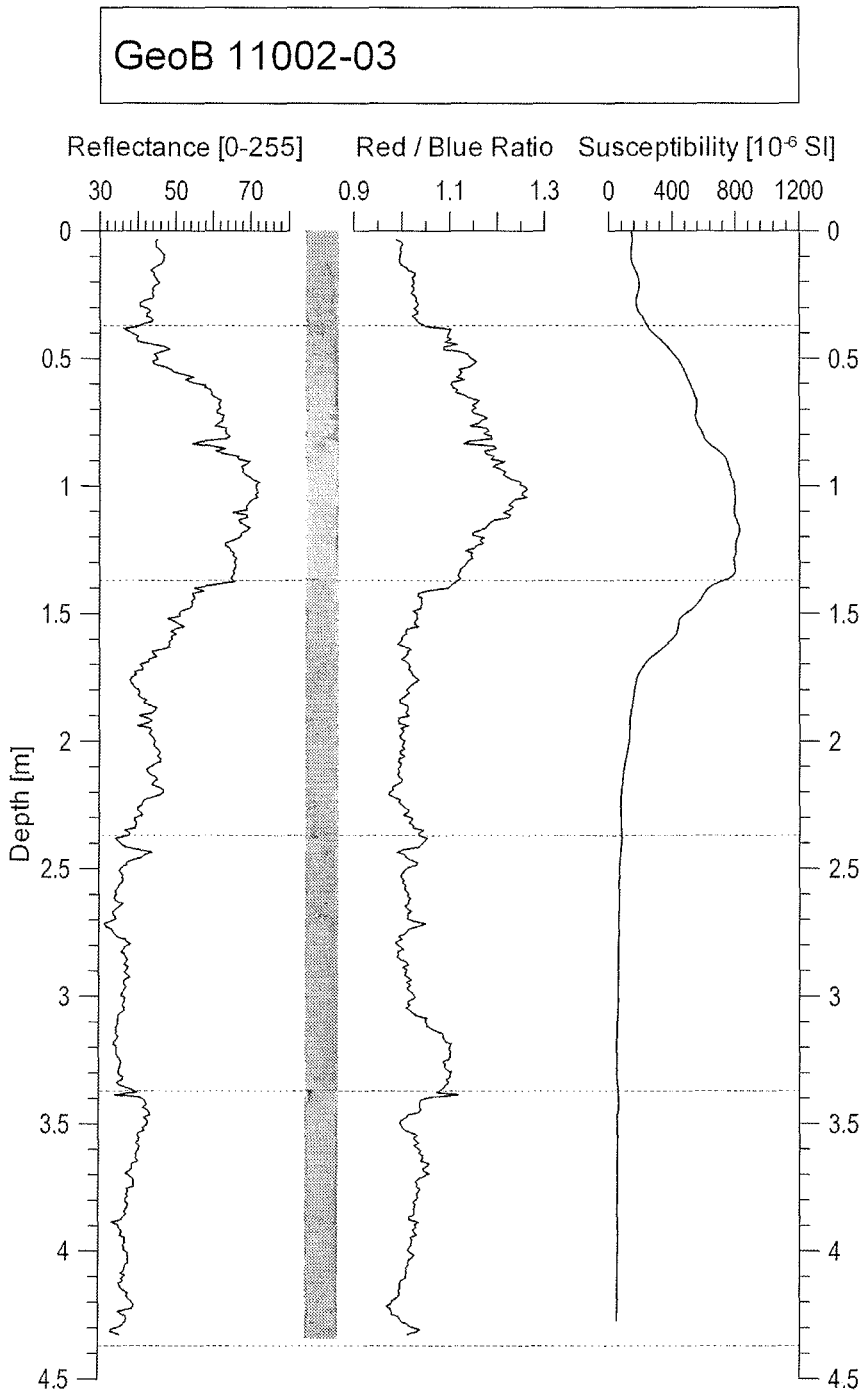



GeoB 11002-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
20
60
100
1.1
1.3
1.5
0
200
400
600
800
Depth [m]
0
0.5
1
1.5
2
2.5

GeoB 11002-3$_{VC}$

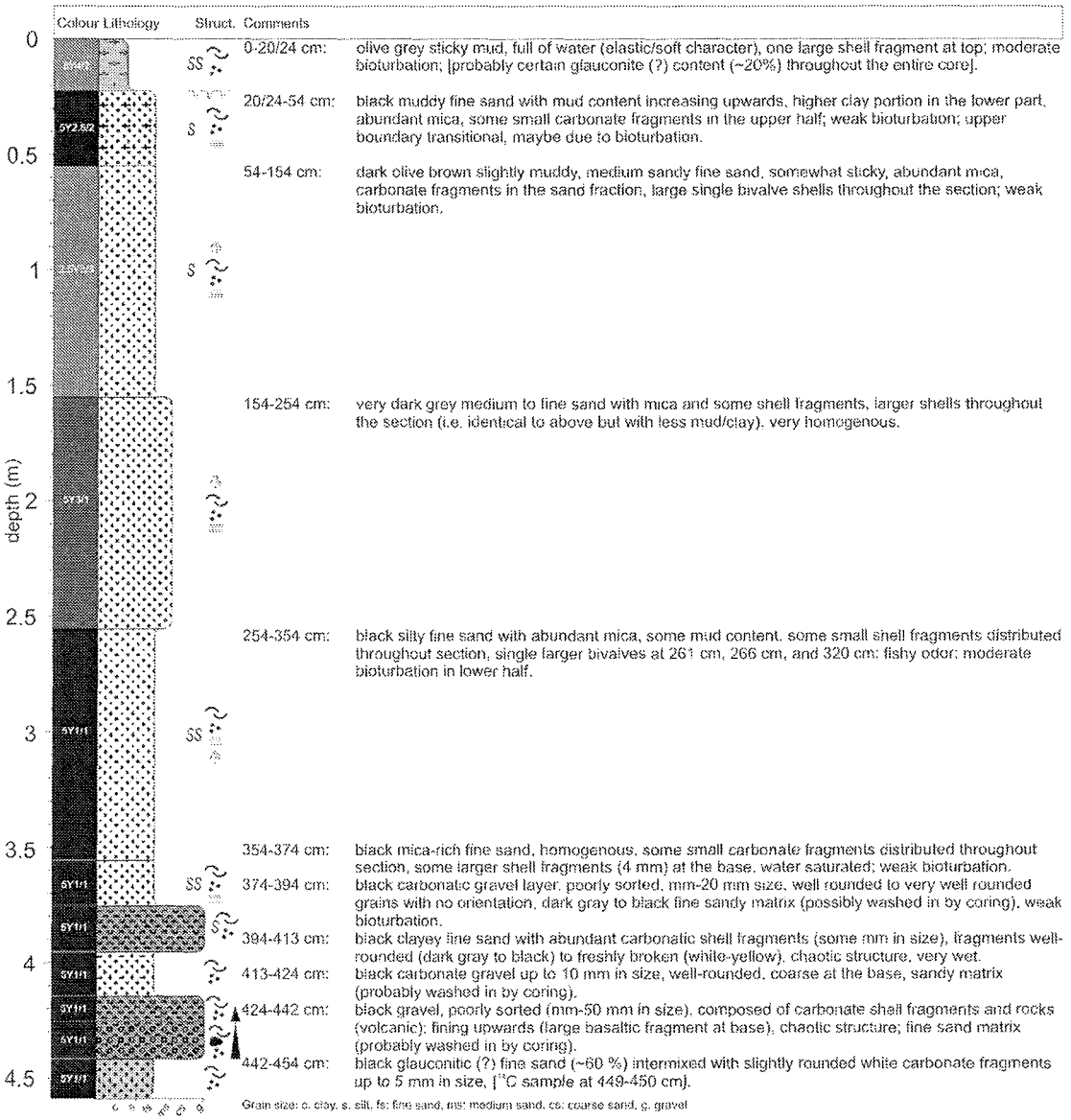
Date: 22.08.06 Pos: 42°10'00"N 8°59'25"W
Water depth: 111 m Core length: 434 cm




GeoB 11002-03
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
30
50
70
0.9
1.1
1.3
0
400
800
1200
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

GeoB 11003-3$_{VC}$

Date: 22.08.06 Pos: 42°10'00"N 9°02'25"W
Water depth: 129 m Core length: 454 cm



0-20/24 cm: olive grey sticky mud, full of water (elastic/soft character), one large shell fragment at top; moderate bioturbation; [probably certain glauconite (?) content (~20%) throughout the entire core].

20/24-54 cm: black muddy fine sand with mud content increasing upwards, higher clay portion in the lower part, abundant mica, some small carbonate fragments in the upper half; weak bioturbation; upper boundary transitional, maybe due to bioturbation.

54-154 cm: dark olive brown slightly muddy, medium sandy fine sand, somewhat sticky, abundant mica, carbonate fragments in the sand fraction, large single bivalve shells throughout the section; weak bioturbation.

154-254 cm: very dark grey medium to fine sand with mica and some shell fragments, larger shells throughout the section (i.e. identical to above but with less mud/clay), very homogenous.

254-354 cm: black silty fine sand with abundant mica, some mud content, some small shell fragments distributed throughout section, single larger bivalves at 261 cm, 266 cm, and 320 cm; fishy odor; moderate bioturbation in lower half.

354-374 cm: black mica-rich fine sand, homogenous, some small carbonate fragments distributed throughout section, some larger shell fragments (4 mm) at the base, water saturated; weak bioturbation.

374-394 cm: black carbonatic gravel layer, poorly sorted, mm-20 mm size, well rounded to very well rounded grains with no orientation, dark gray to black fine sandy matrix (possibly washed in by coring), weak bioturbation.

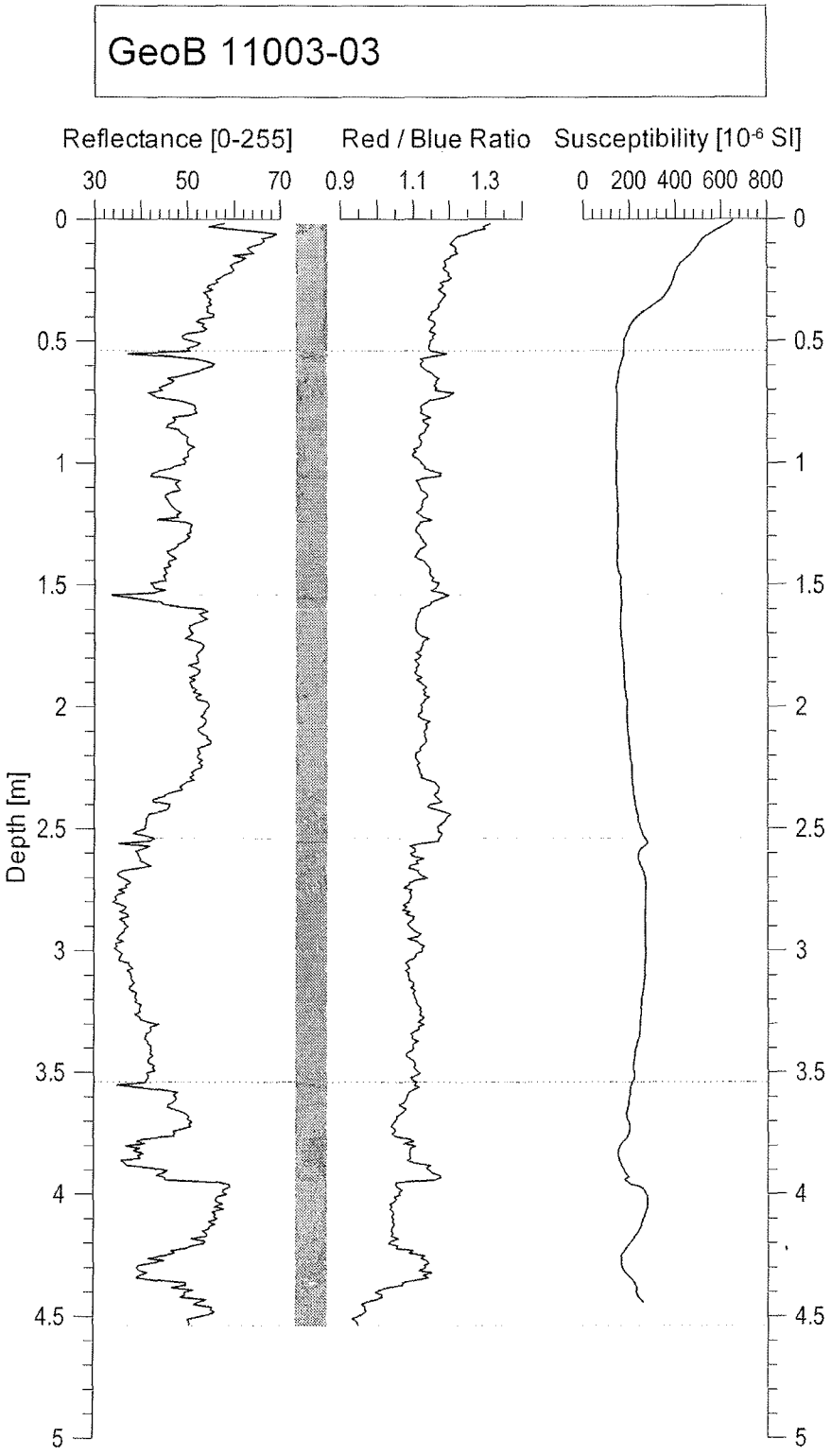
394-413 cm: black clayey fine sand with abundant carbonatic shell fragments (some mm in size), fragments well-rounded (dark gray to black) to freshly broken (white-yellow), chaotic structure, very wet.

413-424 cm: black carbonate gravel up to 10 mm in size, well-rounded, coarse at the base, sandy matrix (probably washed in by coring).

424-442 cm: black gravel, poorly sorted (mm-50 mm in size), composed of carbonate shell fragments and rocks (volcanic); fining upwards (large basaltic fragment at base), chaotic structure; fine sand matrix (probably washed in by coring).

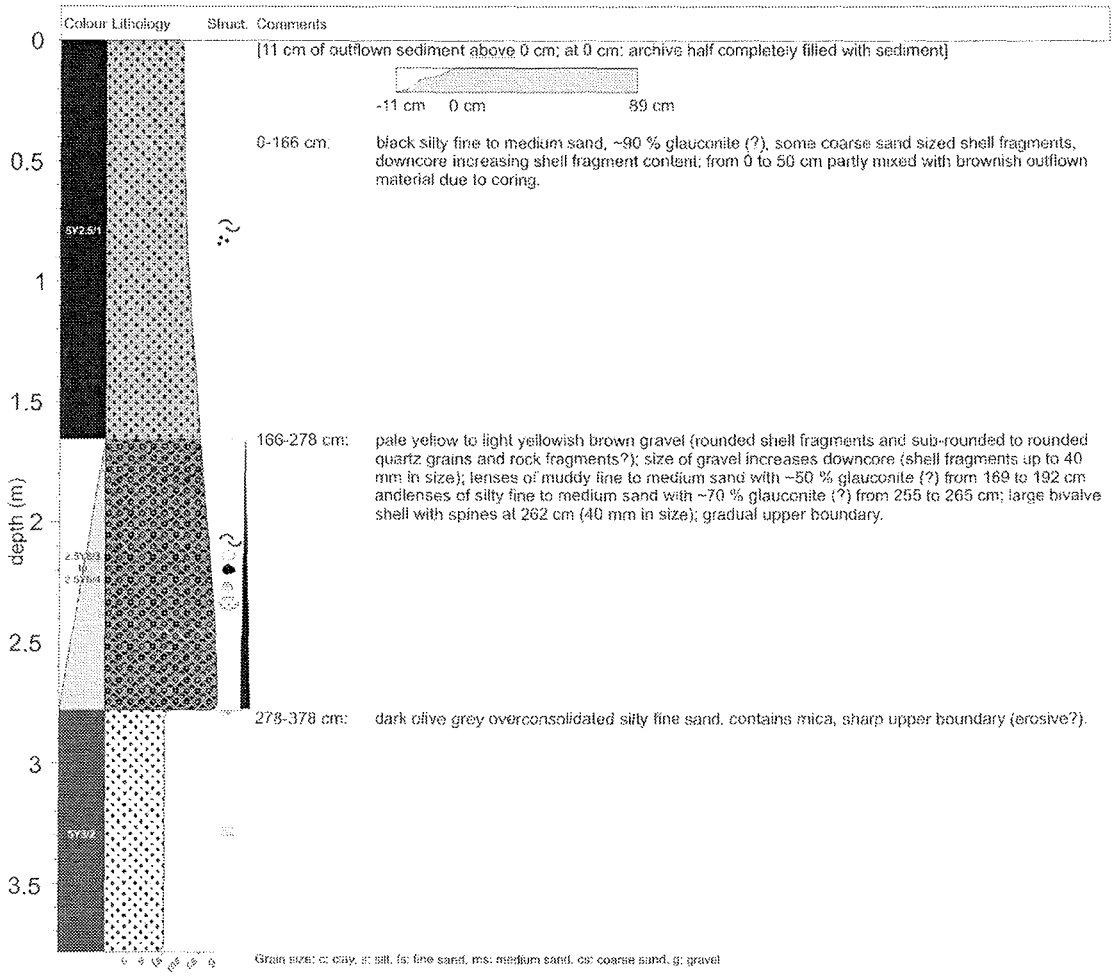
442-454 cm: black glauconitic (?) fine sand (~60 %) intermixed with slightly rounded white carbonate fragments up to 5 mm in size, [^{14}C sample at 449-450 cm].

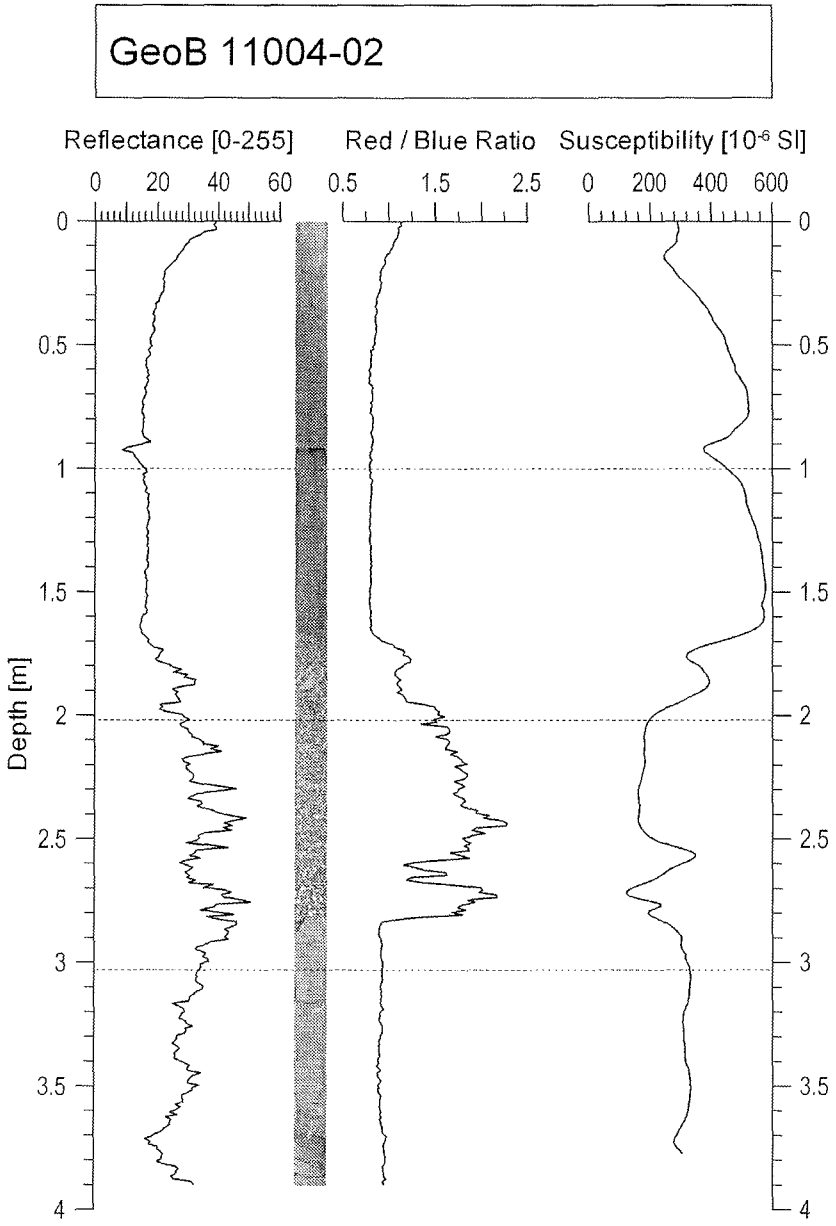
Grain size: c, clay; s, silt; fs: fine sand; ms: medium sand; cs: coarse sand; g, gravel


GeoB 11003-03
Reflectance [0-255]
30
50
70
Red / Blue Ratio
0.9
1.1
1.3
Susceptibility [10-6 SI]
0
200
400
600
800
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

GeoB 11004-2$_{VC}$

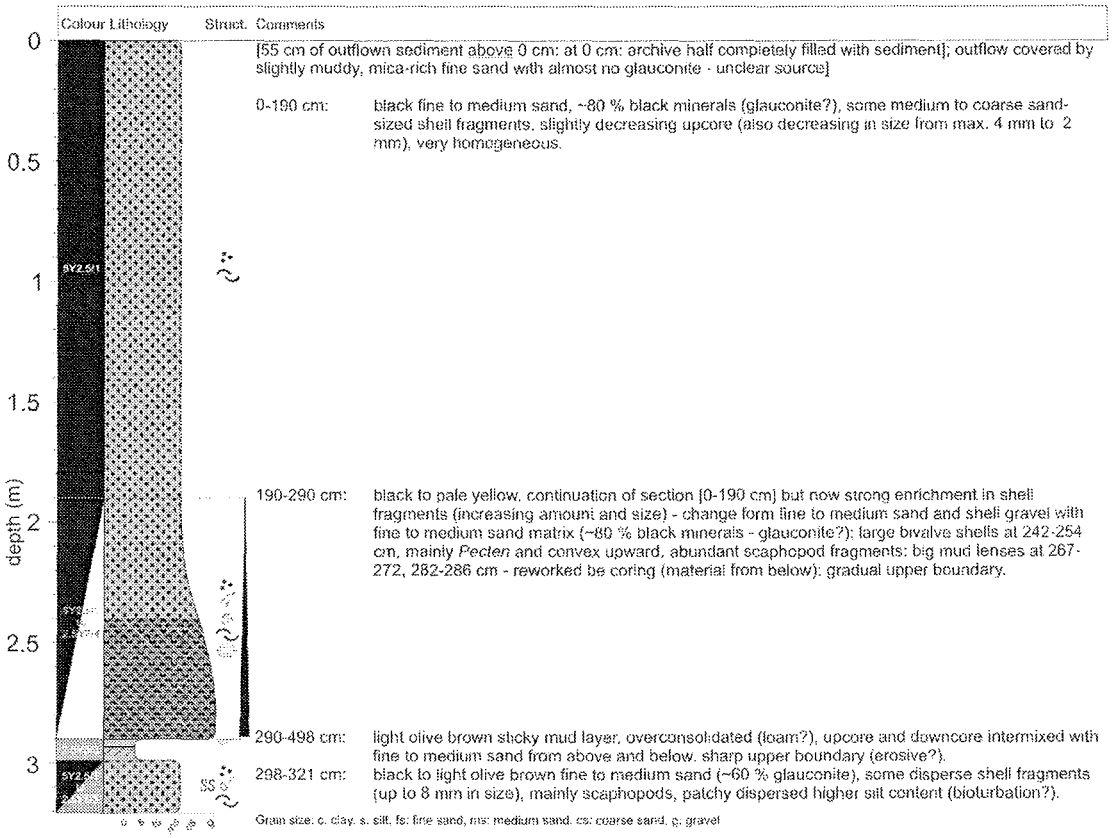
Date: 22.08.06 Pos: 42°10'00"N 9°06'18"W
Water depth: 141 m Core length: 378 cm




GeoB 11004-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
0 20 40 60
0.5 1.5 2.5
0 200 400 600
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4

GeoB 11005-2$_{VC}$

Date: 22.08.06 Pos: 42°10'00"N 9°10'50"W
Water depth: 161 m Core length: 321 cm



[55 cm of outflown sediment above 0 cm: at 0 cm: archive half completely filled with sediment]; outflow covered by slightly muddy, mica-rich fine sand with almost no glauconite - unclear source]

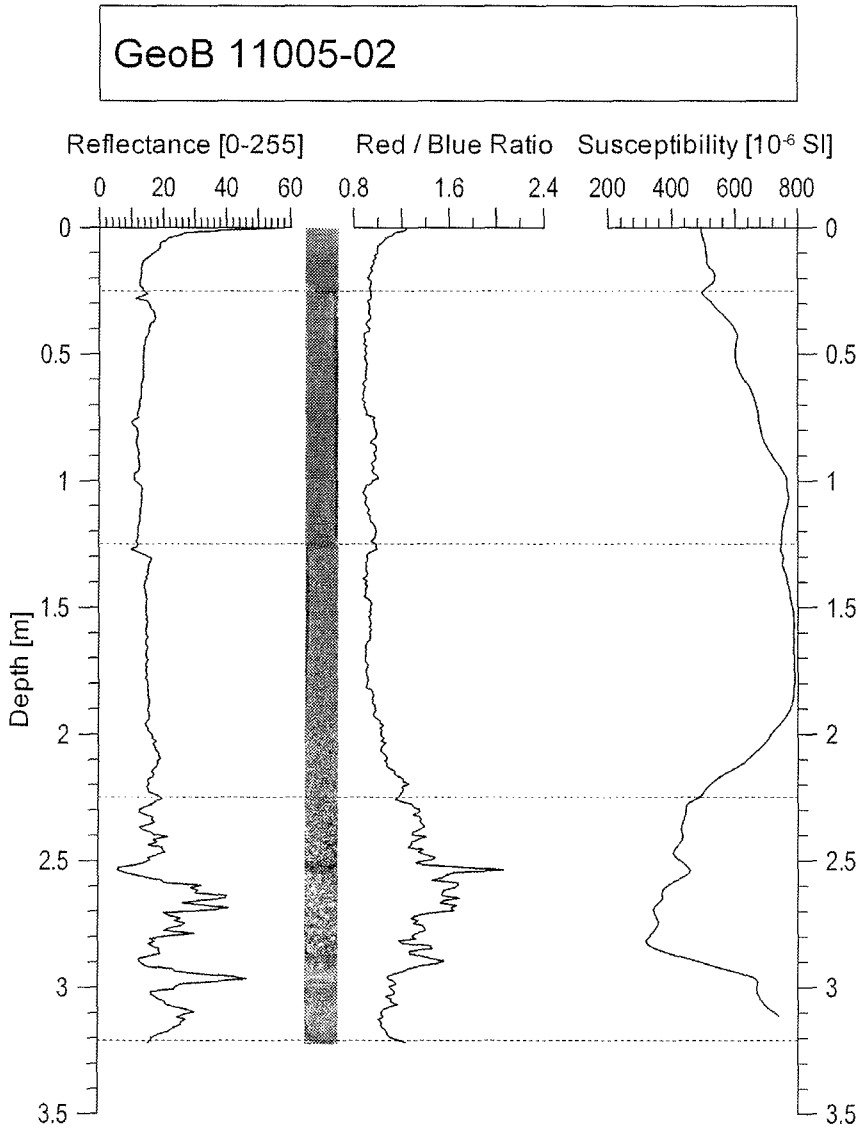
0-190 cm: black fine to medium sand, ~80 % black minerals (glauconite?), some medium to coarse sand-sized shell fragments, slightly decreasing upcore (also decreasing in size from max. 4 mm to 2 mm), very homogeneous.

190-290 cm: black to pale yellow, continuation of section [0-190 cm] but now strong enrichment in shell fragments (increasing amount and size) - change form fine to medium sand and shell gravel with fine to medium sand matrix (~80 % black minerals - glauconite?); large bivalve shells at 242-254 cm, mainly *Pecten* and convex upward, abundant scaphopod fragments; big mud lenses at 267-272, 282-286 cm - reworked be coring (material from below); gradual upper boundary.

290-498 cm: light olive brown sticky mud layer, overconsolidated (loam?), upcore and downcore intermixed with fine to medium sand from above and below, sharp upper boundary (erosive?).

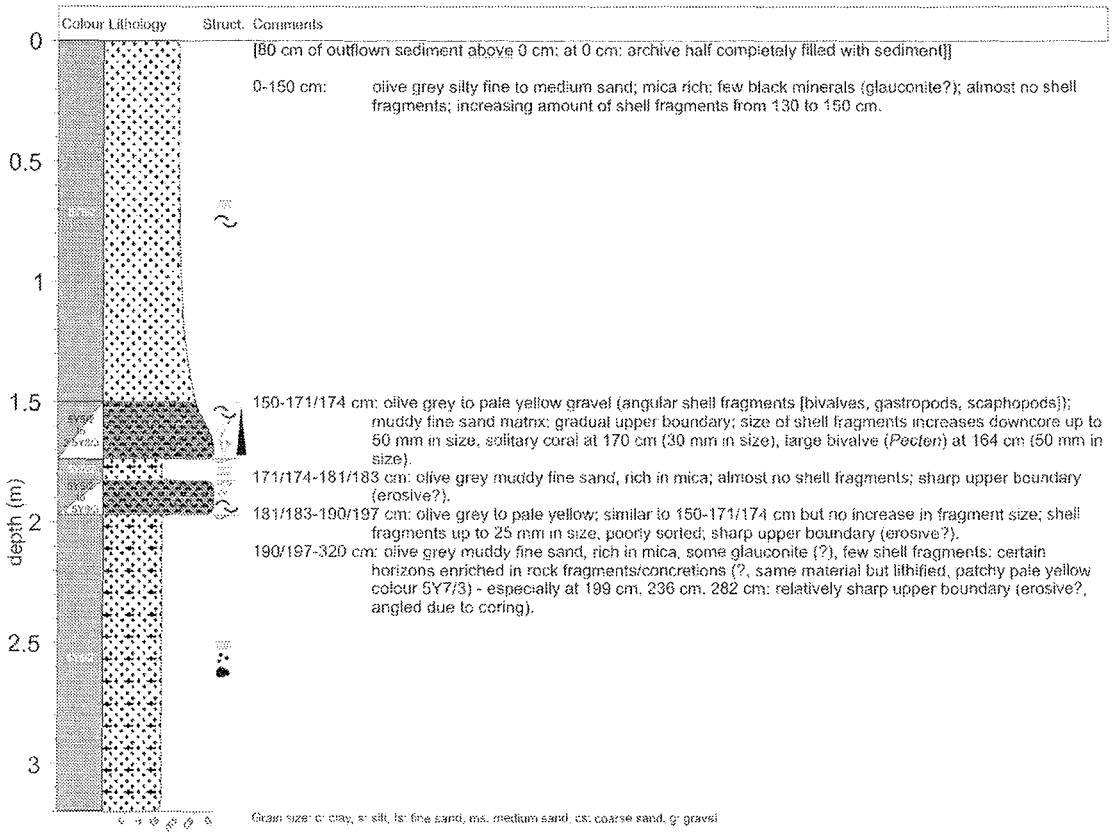
298-321 cm: black to light olive brown fine to medium sand (~60 % glauconite), some disperse shell fragments (up to 8 mm in size), mainly scaphopods, patchy dispersed higher silt content (bioturbation?).

Grain size: c: clay, s: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel


GeoB 11005-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
0 20 40 60
0.8 1.6 2.4
200 400 600 800
Depth [m]
0 0.5 1 1.5 2 2.5 3 3.5

GeoB 11007-2$_{VC}$

Date: 22.08.06 Pos: 42°09'60"N 9°13'49"W
Water depth: 183 m Core length: 320 cm



[80 cm of outflown sediment above 0 cm: at 0 cm: archive half completely filled with sediment]]

0-150 cm: olive grey silty fine to medium sand; mica rich; few black minerals (glauconite?); almost no shell fragments; increasing amount of shell fragments from 130 to 150 cm.

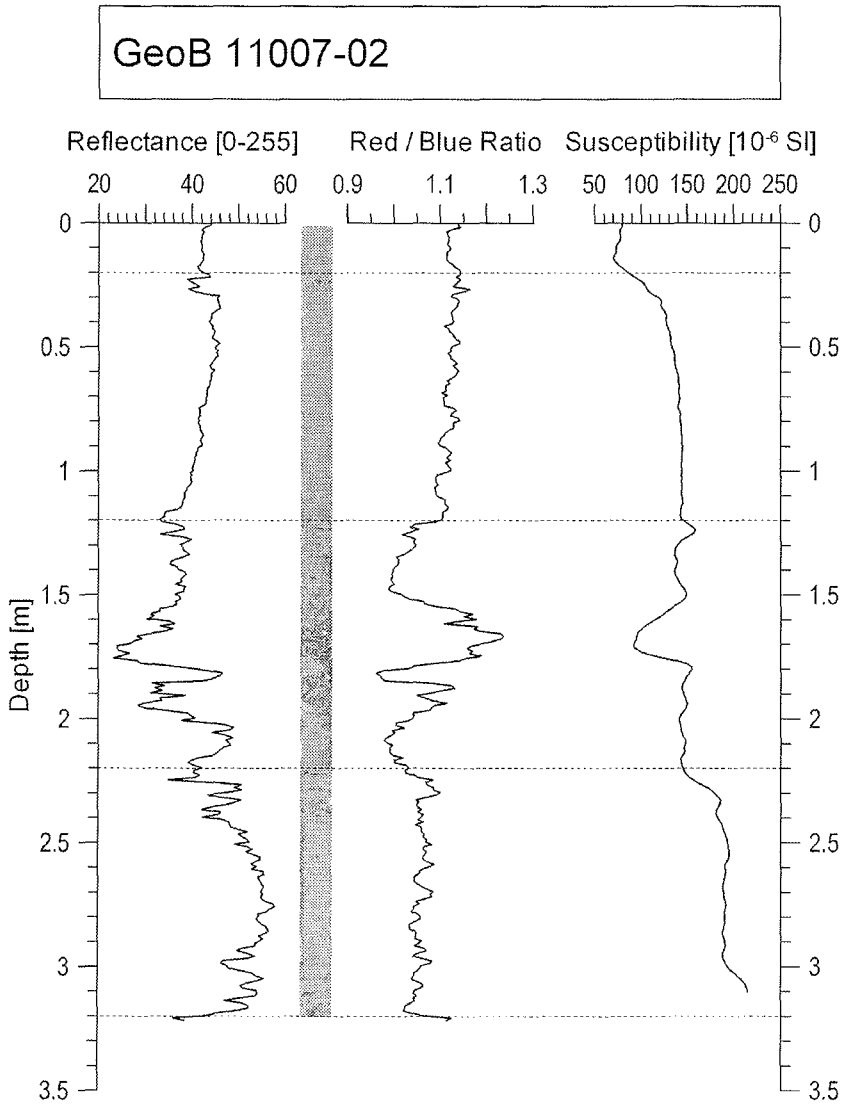
150-171/174 cm: olive grey to pale yellow gravel (angular shell fragments [bivalves, gastropods, scaphopods]); muddy fine sand matrix; gradual upper boundary; size of shell fragments increases downcore up to 50 mm in size, solitary coral at 170 cm (30 mm in size), large bivalve (*Pecten*) at 164 cm (50 mm in size).

171/174-181/183 cm: olive grey muddy fine sand, rich in mica; almost no shell fragments; sharp upper boundary (erosive?).

181/183-190/197 cm: olive grey to pale yellow; similar to 150-171/174 cm but no increase in fragment size; shell fragments up to 25 mm in size, poorly sorted; sharp upper boundary (erosive?).

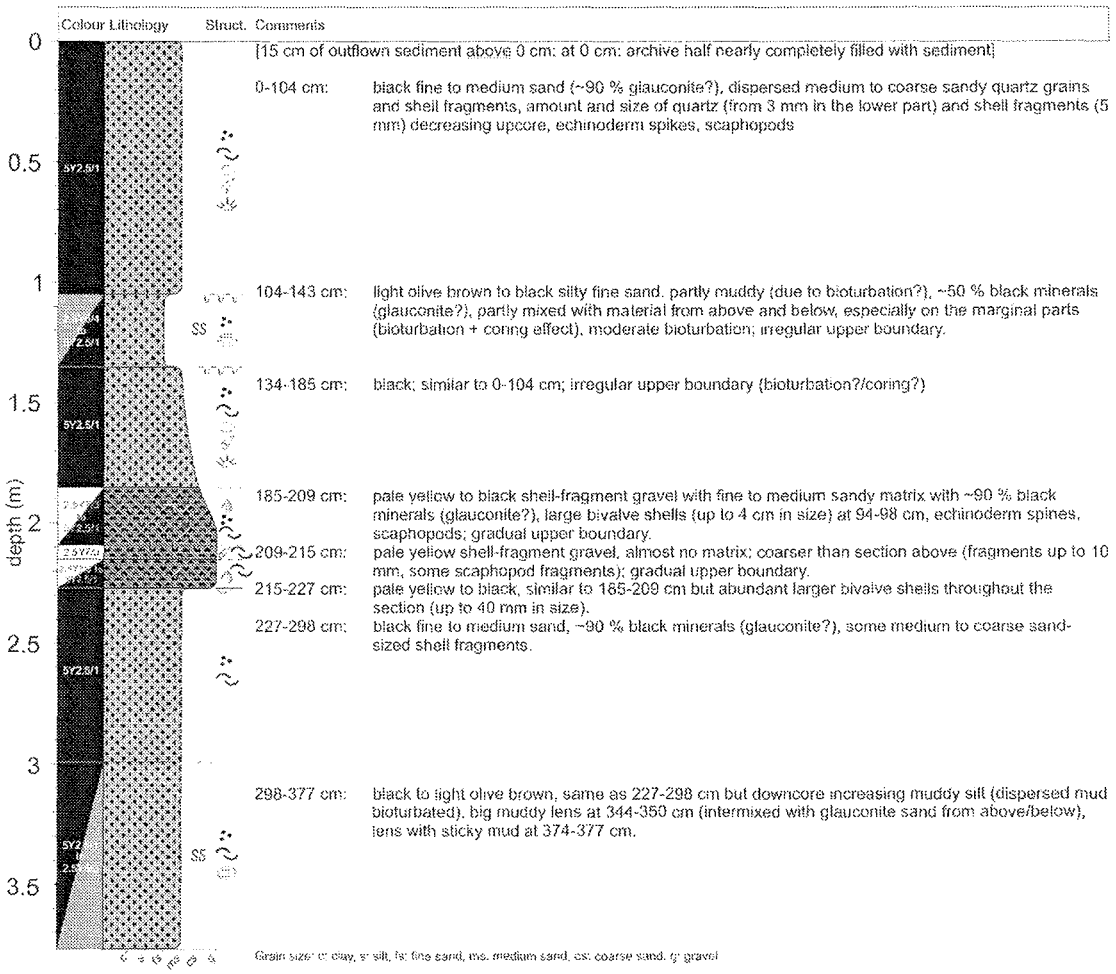
190/197-320 cm: olive grey muddy fine sand, rich in mica, some glauconite (?), few shell fragments; certain horizons enriched in rock fragments/concretions (?, same material but lithified, patchy pale yellow colour 5Y7/3) - especially at 199 cm, 236 cm, 282 cm: relatively sharp upper boundary (erosive?, angled due to coring).

Grain size: c: clay, si: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel


GeoB 11007-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
20
40
60
0.9
1.1
1.3
50
100
150
200
250
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5

GeoB 11008-2$_{VC}$

Date: 23.08.06 Pos: 42°21'29"N 9°13'00"W
Water depth: 157 m Core length: 377 cm



[15 cm of outflown sediment above 0 cm; at 0 cm: archive half nearly completely filled with sediment]

0-104 cm: black fine to medium sand (~90 % glauconite?), dispersed medium to coarse sandy quartz grains and shell fragments, amount and size of quartz (from 3 mm in the lower part) and shell fragments (5 mm) decreasing upcore, echinoderm spikes, scaphopods

104-143 cm: light olive brown to black silty fine sand, partly muddy (due to bioturbation?), ~50 % black minerals (glauconite?), partly mixed with material from above and below, especially on the marginal parts (bioturbation + coring effect), moderate bioturbation; irregular upper boundary.

134-185 cm: black; similar to 0-104 cm; irregular upper boundary (bioturbation?/coring?)

185-209 cm: pale yellow to black shell-fragment gravel with fine to medium sandy matrix with ~90 % black minerals (glauconite?), large bivalve shells (up to 4 cm in size) at 94-98 cm, echinoderm spines, scaphopods; gradual upper boundary.

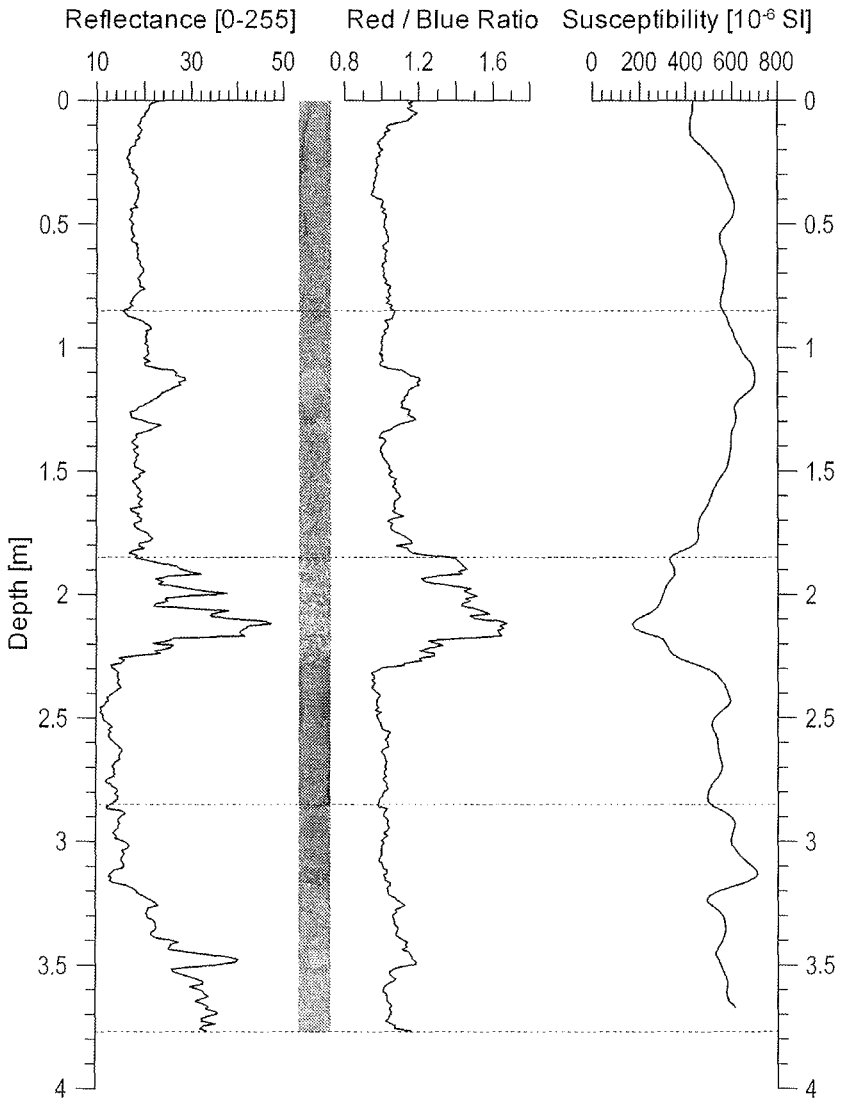
209-215 cm: pale yellow shell-fragment gravel, almost no matrix; coarser than section above (fragments up to 10 mm, some scaphopod fragments); gradual upper boundary.

215-227 cm: pale yellow to black, similar to 185-209 cm but abundant larger bivalve shells throughout the section (up to 40 mm in size).

227-298 cm: black fine to medium sand, ~90 % black minerals (glauconite?), some medium to coarse sand-sized shell fragments.

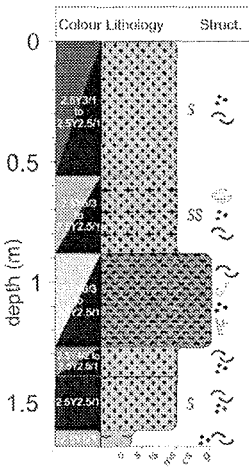
298-377 cm: black to light olive brown, same as 227-298 cm but downcore increasing muddy silt (dispersed mud bioturbated), big muddy lens at 344-350 cm (intermixed with glauconite sand from above/below), lens with sticky mud at 374-377 cm.

GeoB 11008-02

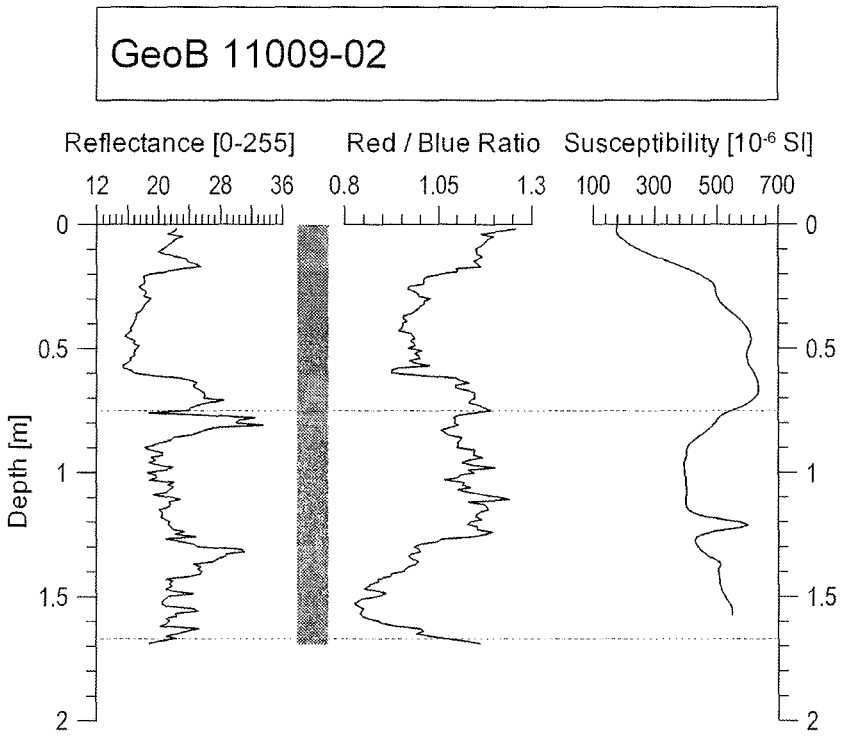


GeoB 11009-2$_{VC}$

Date: 23.08.06 Pos: 42°25'29"N 9°16'00"W
Water depth: 166 m Core length: 167 cm

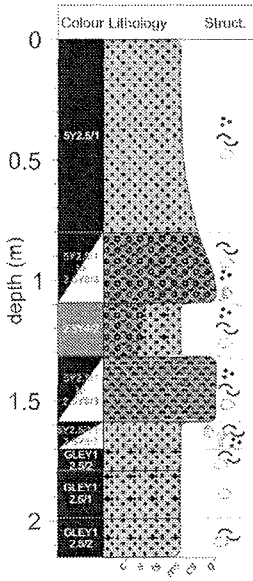


[upper 17 cm: archive half only 3/4 filled with sediment (outflow in water column?)]
0-56/63 cm: very dark grey to black fine to medium sand, rich in black minerals (glauconite?), shell fragments up to 3 mm in size with decreasing content from bottom to 41 cm (in amount and in size - up to 8 mm), same with the quartz content (up to 3 mm in size): colour of fragments: white, yellowish and brown; weak bioturbation.
(56/63-58/64 cm:) black fine to medium sand, 80 % glauconite (?), very few small shell fragments, some coarse-grained quartz, upper boundary distorted (due to coring?).
58/64-88/92 cm: light olive brown to black muddy fine to medium sand, abundant glauconite? (~50 %), moderately bioturbated, some shell fragments (up to 5 mm in size), several mud lenses (bioturbation?), upper boundary distorted.
88/92-127/130 cm: light yellowish brown to black, poorly sorted shelly gravel with fine to medium sandy matrix (>80 % glauconite?), with 1-3 mm sized quartz grains, solitary coral fragment at 155.5 cm, some scaphopod fragments, shell fragments (white, yellowish, brownish), upper boundary distorted.
127/130-139 cm: black to dark greyish silty fine to medium sand (>50 % glauconite?), abundant shell fragments (up to 6 mm in size), some smaller quartz grains (up to 2 mm).
139-162/165 cm: black fine to medium sand (>80 % glauconite?), abundant shell fragments (up to 4 mm, mainly >2 mm), slightly bioturbated, upper boundary gradual - decreasing silt and shell-fragment content.
162/165-167 cm: light olive brown mud, intermixed with fine to medium sand (glauconite) and shell fragments (due to coring?).
Grain size: c: clay, s: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel


GeoB 11009-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
12 20 28 36
0.8 1.05 1.3
100 300 500 700
Depth [m]
0
0.5
1
1.5
2

GeoB 11009-3$_{VC}$

Date: 28.08.06 Pos: 42°25'30"N 9°15'60"W
Water depth: 165 m Core length: 215 cm



[50 cm of outflown sediment above 0 cm; at 0 cm: archive half completely filled with sediment!]

0-80 cm: black silty fine to medium sand; >80 % black minerals (glauconite?), no mica?; some medium to coarse sandy shell fragments in the upper part, amount and size of shell fragments increases downcore; increasing content of medium to coarse sandy quartz grains downcore.

80-109 cm: black to pale yellow gravel (angular shell fragments up to 6 mm in size and rounded quartz grains up to 3 mm in size); material of matrix similar to section above; large bivalve fragment at 109 cm (15 mm); gradual upper boundary.

109-123/144 cm: dark greyish brown muddy fine to medium sand; material from above is mixed in; very irregular upper boundary due to coring (?).

123/144-158 cm: black to pale yellow gravel, shell fragments (mostly sub-angular, slightly coarsening downcore, mostly <5 mm in size, larger shell fragments mainly in lower part then up to 50 mm in size) and some sub-rounded to well-rounded quartz grains. Matrix: black fine sandy medium sand, ~80 % black minerals (glauconite?); very irregular angled upper surface mixing due to coring; [core catcher film at 156-181 cm, marginal].

158-170/172 cm: coarse and fine sandy medium sand with abundant bivalve shells (up to 30 mm in size), shell fragments and some solitary coral fragment, coarse sand made up by shell fragments, fine sandy medium sand by >80 % black minerals (glauconite?).

170/172-176/178 cm: very dark greyish green very stiff overconsolidated muddy fine to medium sand, some shell fragments and well rounded quartz grains; sharp upper boundary.

176/178- 198 cm: greenish black, comparable to 170/172-176/178 cm but darker and not as greenish and less shell fragments.

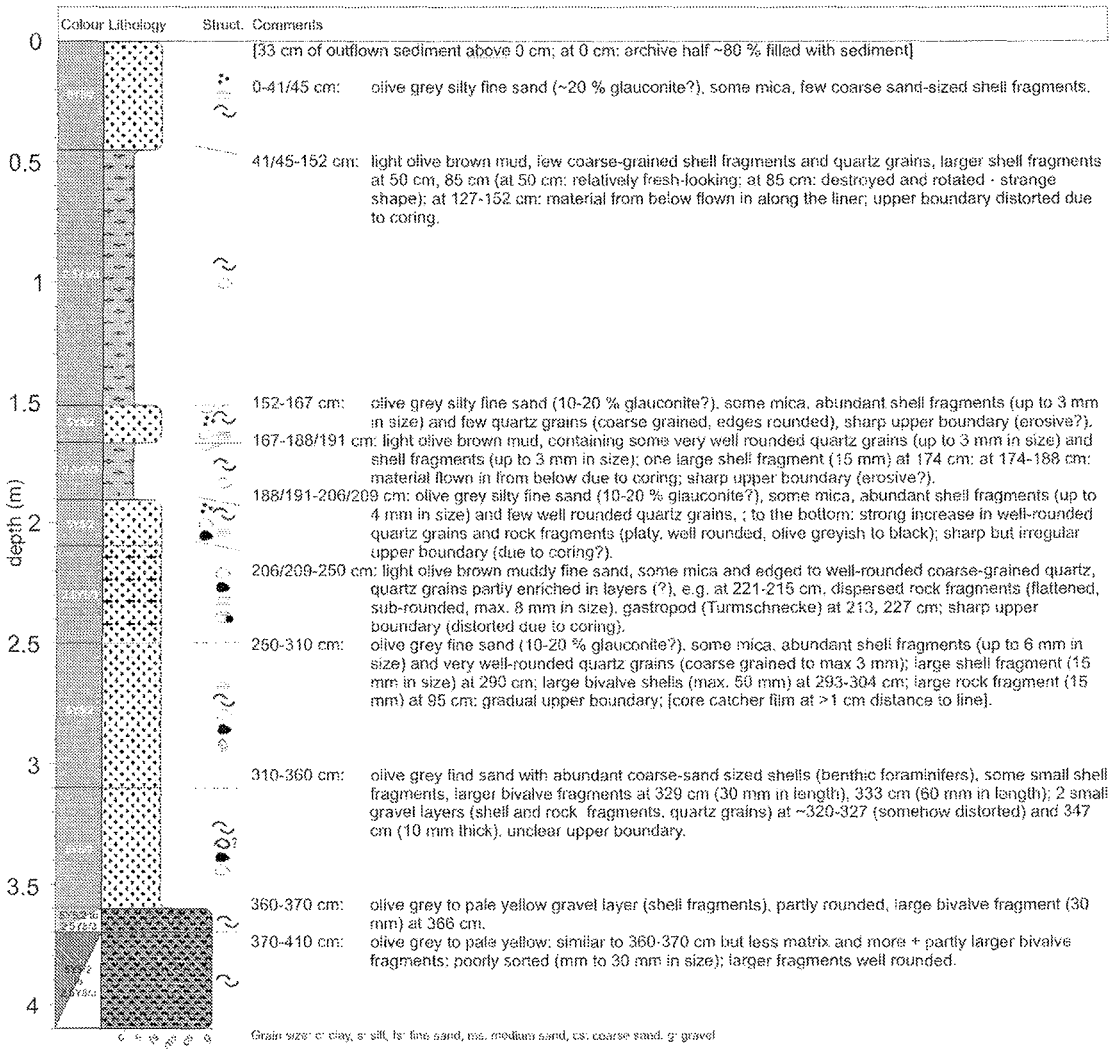
198-215 cm: very dark greyish green, comparable to 170/172-176/178 cm but even more stiff.

Grain size: c: clay, s: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel

No physical properties data available

GeoB 11010-2$_{VC}$

Date: 23.08.06 Pos: 42°25'00"N 9°06'29"W
Water depth: 119 m Core length: 410 cm



[33 cm of outflown sediment above 0 cm; at 0 cm: archive half ~80 % filled with sediment]

0-41/45 cm: olive grey silty fine sand (~20 % glauconite?), some mica, few coarse sand-sized shell fragments.

41/45-152 cm: light olive brown mud, few coarse-grained shell fragments and quartz grains, larger shell fragments at 50 cm, 85 cm (at 50 cm: relatively fresh-looking; at 85 cm: destroyed and rotated - strange shape); at 127-152 cm: material from below flown in along the liner; upper boundary distorted due to coring.

152-167 cm: olive grey silty fine sand (10-20 % glauconite?), some mica, abundant shell fragments (up to 3 mm in size) and few quartz grains (coarse grained, edges rounded), sharp upper boundary (erosive?).

167-188/191 cm: light olive brown mud, containing some very well rounded quartz grains (up to 3 mm in size) and shell fragments (up to 3 mm in size); one large shell fragment (15 mm) at 174 cm; at 174-188 cm: material flown in from below due to coring; sharp upper boundary (erosive?).

188/191-206/209 cm: olive grey silty fine sand (10-20 % glauconite?), some mica, abundant shell fragments (up to 4 mm in size) and few well rounded quartz grains, ; to the bottom: strong increase in well-rounded quartz grains and rock fragments (platy, well rounded, olive greyish to black); sharp but irregular upper boundary (due to coring?).

206/209-250 cm: light olive brown muddy fine sand, some mica and edged to well-rounded coarse-grained quartz, quartz grains partly enriched in layers (?), e.g. at 221-215 cm, dispersed rock fragments (flattened, sub-rounded, max. 8 mm in size), gastropod (Turmschnecke) at 213, 227 cm; sharp upper boundary (distorted due to coring).

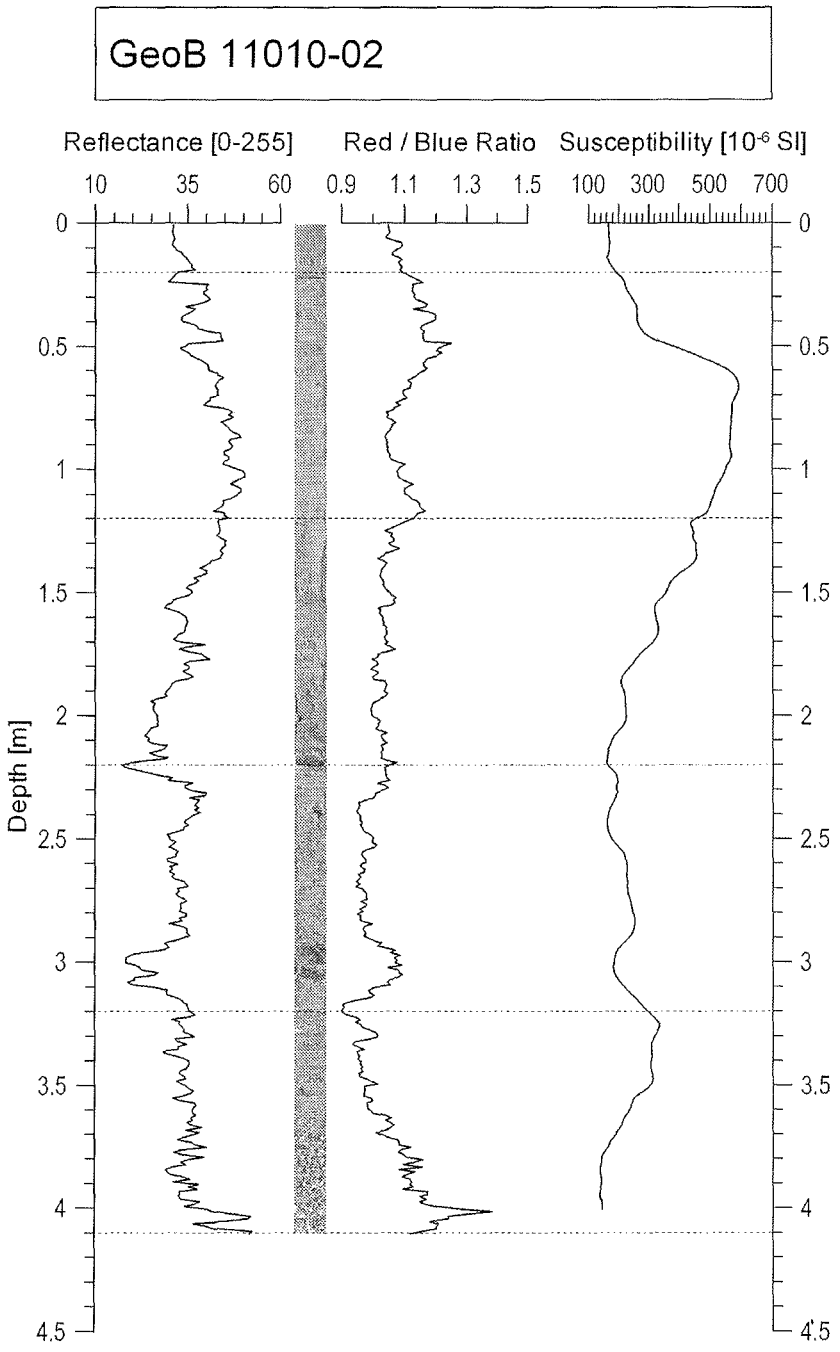
250-310 cm: olive grey fine sand (10-20 % glauconite?), some mica, abundant shell fragments (up to 6 mm in size) and very well-rounded quartz grains (coarse grained to max 3 mm); large shell fragment (15 mm in size) at 290 cm; large bivalve shells (max. 50 mm) at 293-304 cm; large rock fragment (15 mm) at 95 cm; gradual upper boundary; [core catcher film at >1 cm distance to line].

310-360 cm: olive grey find sand with abundant coarse-sand sized shells (benthic foraminifers), some small shell fragments, larger bivalve fragments at 329 cm (30 mm in length), 333 cm (60 mm in length); 2 small gravel layers (shell and rock fragments, quartz grains) at ~320-327 (somehow distorted) and 347 cm (10 mm thick), unclear upper boundary.

360-370 cm: olive grey to pale yellow gravel layer (shell fragments), partly rounded, large bivalve fragment (30 mm) at 366 cm.

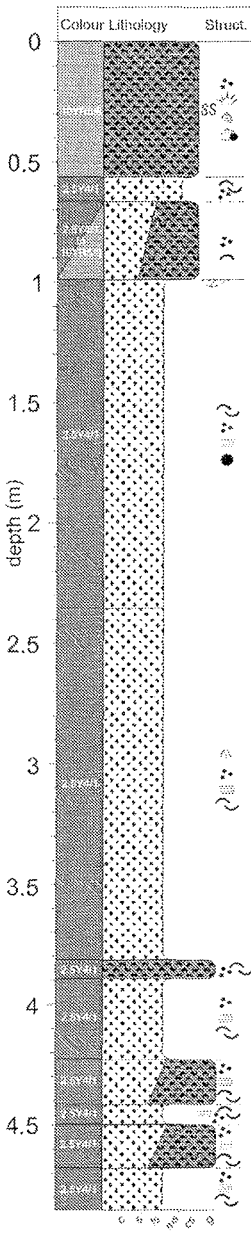
370-410 cm: olive grey to pale yellow; similar to 360-370 cm but less matrix and more + partly larger bivalve fragments; poorly sorted (mm to 30 mm in size); larger fragments well rounded.

Grain size: c: clay, si: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel


GeoB 11010-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
10
35
60
0.9
1.1
1.3
1.5
100
300
500
700
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

GeoB 11011-2$_{VC}$

Date: 23.08.06 Pos: 42°31'39"N 9°12'07"W
Water depth: 100 m Core length: 485 cm



Comments

0-55 cm: yellowish brown fine to coarse sandy shell fragments with ~20 % fine to medium sandy glauconite?, some larger shell fragments (up to 3 mm in size) throughout, few echinoderm spines; 2 larger shells at 34-35 cm: [1]: 20 mm, freshly looking bivalve, "upside down", grey; [2]: 45x40 mm, gastropod, grey to brownish, many small holes by boring organisms - not fresh; few larger shell fragments (up to 15 mm) at 38 cm, 51 cm, 53 cm; at 16 cm, 27 cm, patches with mud fine to medium sandy shell fragments (smaller grain size) and increased content of silty fine to medium sand (bioturbation?), one single of these patches at 41-44 cm.

(55-57 cm:) dark grey muddy fine sand, some mica, some medium sized shell fragments.

57-67 cm: dark grey silty fine to medium sand with abundand coarse sand-sized shell fragments, sharp upper boundary, some glauconite (?).

67-98 cm. dark grey to yellowish brown, intermixture; outer parts consist of material same as 57-67 cm, inner parts same material as 0-55 cm - disturbance due to coring?; larger bivalves at 73 cm, 85 cm, 94 cm, 97 cm (up to 4 cm in size); larger bivalve shells at 90 cm, 92 cm (up to 40 mm in size); upper boundary very irregular (due to coring?).

98-233/235 cm: dark grey silty fine sand, ~20 % glauconite (?), some mica, some medium to coarse sandy shell fragments dispersed throughout the section, organic spot at 111-117 cm; layers of shell fragments up to 4 mm in size at 53-58, 72 cm; 2 bis bivalve fragments (up to 40 mm in size) at 82 cm, 85 cm.

233/235-381/382 cm: dark grey silty fine sand, rich in mica, ~10 % fine-sandy glauconite (?), erosive upper boundary, glauconite content decreases downcore; material comparable to 98-233/235 cm but less and finer grained glauconite (?) and no shell fragments; increased shell content (up to 5 mm in size) at 280, 297-381/382 cm; bivalve (15 mm in size) at 308 cm.

381/382-389 cm: dark grey, comparable to parts with increased shell content in section 233/235-381/382 cm but shell fragments are major content -> shell fragment gravel with silty fine sandy matrix, with ~20 % fine-sandy glauconite (?).

389-423 cm: dark grey silty fine sand, rich in mica, ~20 % fine-sandy glauconite, some large (max. 5 mm) shell fragments dispersed.

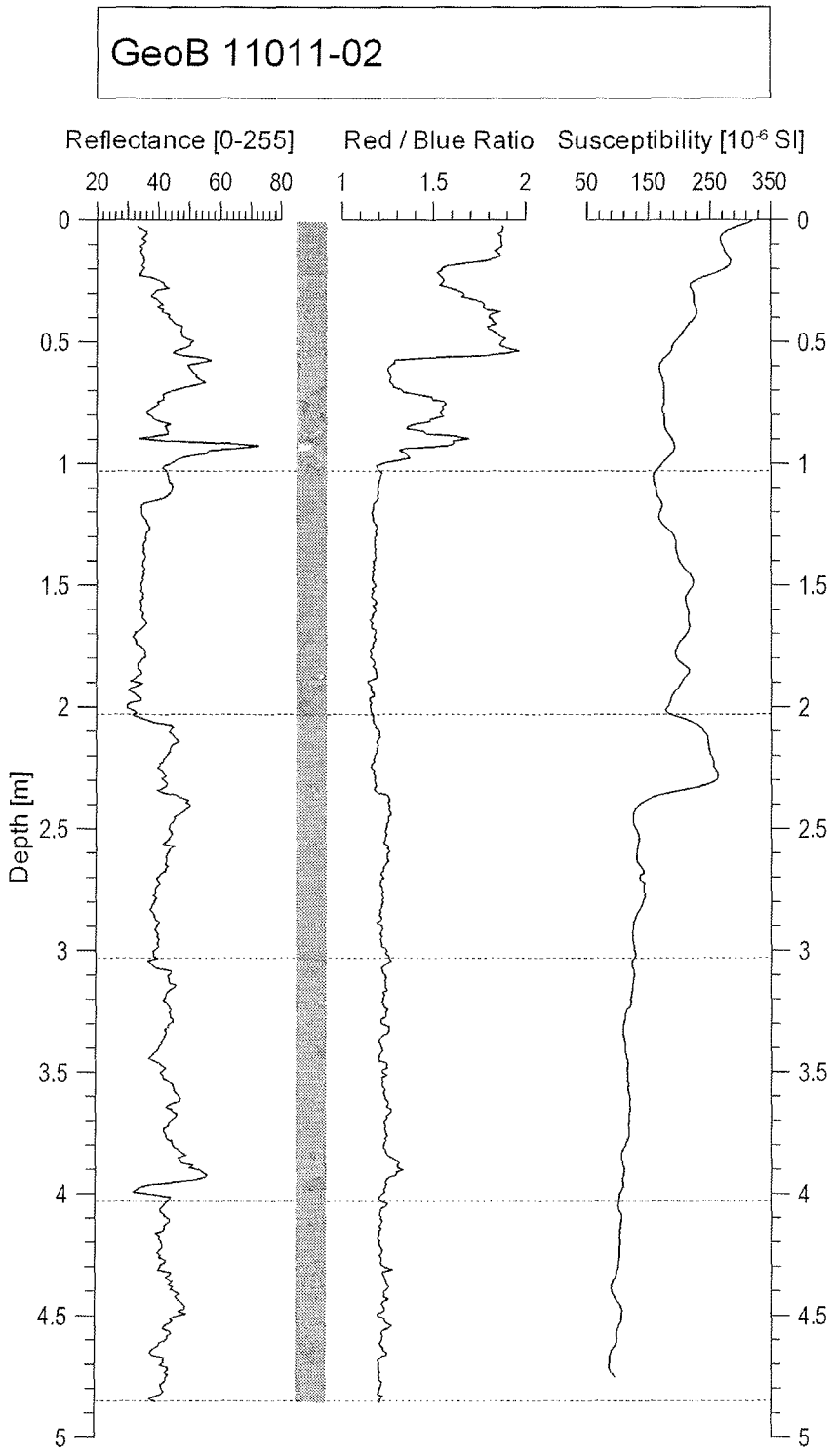
423-442 cm: dark grey, mixture: shell fragment gravel, with silty fine-sandy matrix and silty fine sand, rich in mica, ~20 % fine-sandy glauconite (?) with few shell fragments; one large (2.5 cm) bivalve fragment at 429 cm.

442-450 cm: dark grey, similar to 398-423 cm.

450-468 cm: dark grey, similar to 423-442 cm.

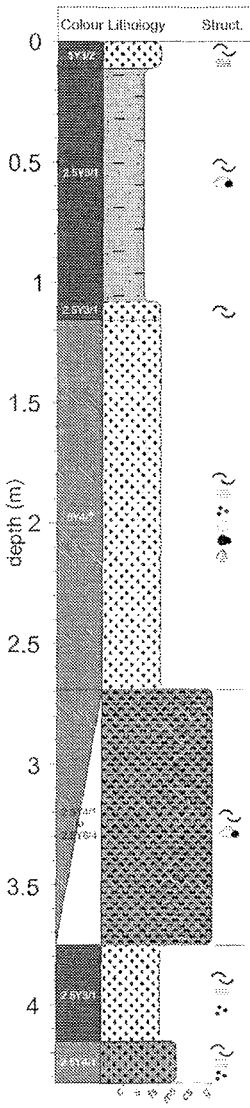
468-485 cm: dark grey, similar to 389-423 cm.

Grain size: c: clay, s: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel


GeoB 11011-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
20 40 60 80
1 1.5 2
50 150 250 350
Depth [m]
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5

GeoB 11012-2$_{VC}$

Date: 24.08.06 Pos: 42°42'29"N 9°16'00"W
Water depth: 119 m Core length: 428 cm



0-10/12 cm: dark olive grey homogeneous fine sand, rich in mica, some dispersed shell debris.

10/12-107 cm: very dark grey clayey silt to silty clay, slightly fine sandy; portion of higher clay content at 53-62 cm lowermost 30 cm very silty/fine sandy; abundant shell fragments of 5 mm in size and complete *Turitella* (15 mm in height), highest shell content from 107-64 cm.

107-116 cm: very dark grey, similar to above: clayey/silty fine sand, but with densely packed large shell fragments with max. 20 mm in size, freshly broken (storm layer?).

116-269 cm: olive grey silty fine sand, 10-20 % black minerals (glauconite?), rich in mica, some shell fragments throughout (max. 5 mm in size), enrichment of shell fragments (also some rounded quartz grains and rock fragments) at the outer parts (near the liner) due to coring?; large shell fragments at 178, 181, 183, 201 (max. 30 mm in size); bivalves at 194, 191 (less than 10 mm in size).

269-375 cm: dark grey massive shell gravel bed, broken shells of some mm to 30 mm in size, fine sandy matrix at 349-269 cm, shells whitish, yellowish, greyish, mainly bivalves, some gastropods, fragments well rounded to sharp angeled, chaotic bedding; lower part (345-375 cm): shells pale yellow to light yellowish brown; sharp upper boundary.

375-414/419 cm: very dark grey very slightly coarse sandy medium sandy fine sand, rich in mica and black minerals (glauconite?), some larger shell fragments dispersed throughout; sharp upper boundary (distorted due to coring).

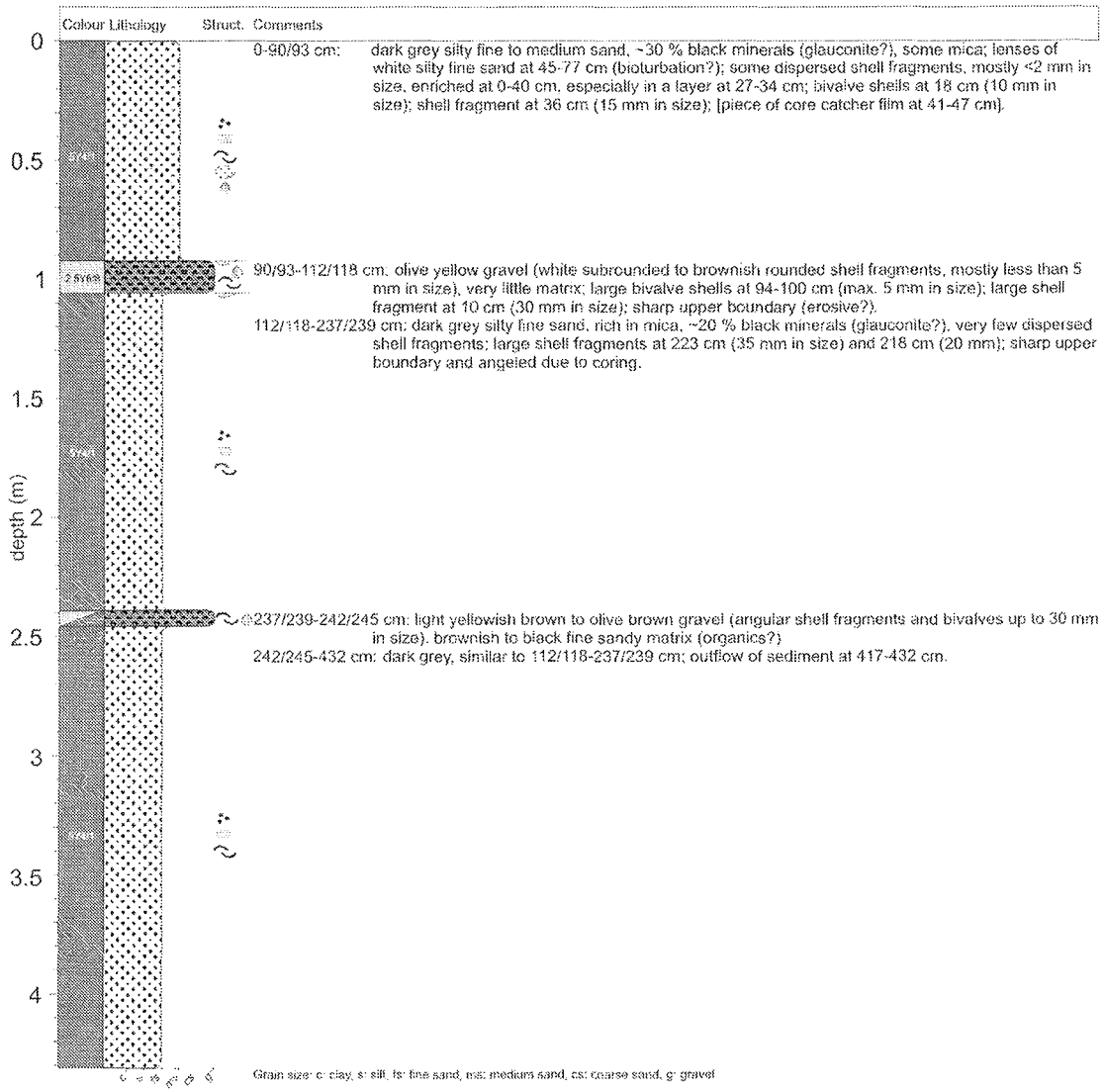
414/419-426/431 cm: dark grey fine to medium sandy fine gravel of well-rounded shell fragments (mm to 10 mm in size), filled with fine sandy matrix that looks similar to 375-414/419 cm (mica and glauconite), shells whitish, yellowish, brownish.

Grain size: c: clay, s: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel

No physical properties data available

GeoB 11013-2$_{VC}$

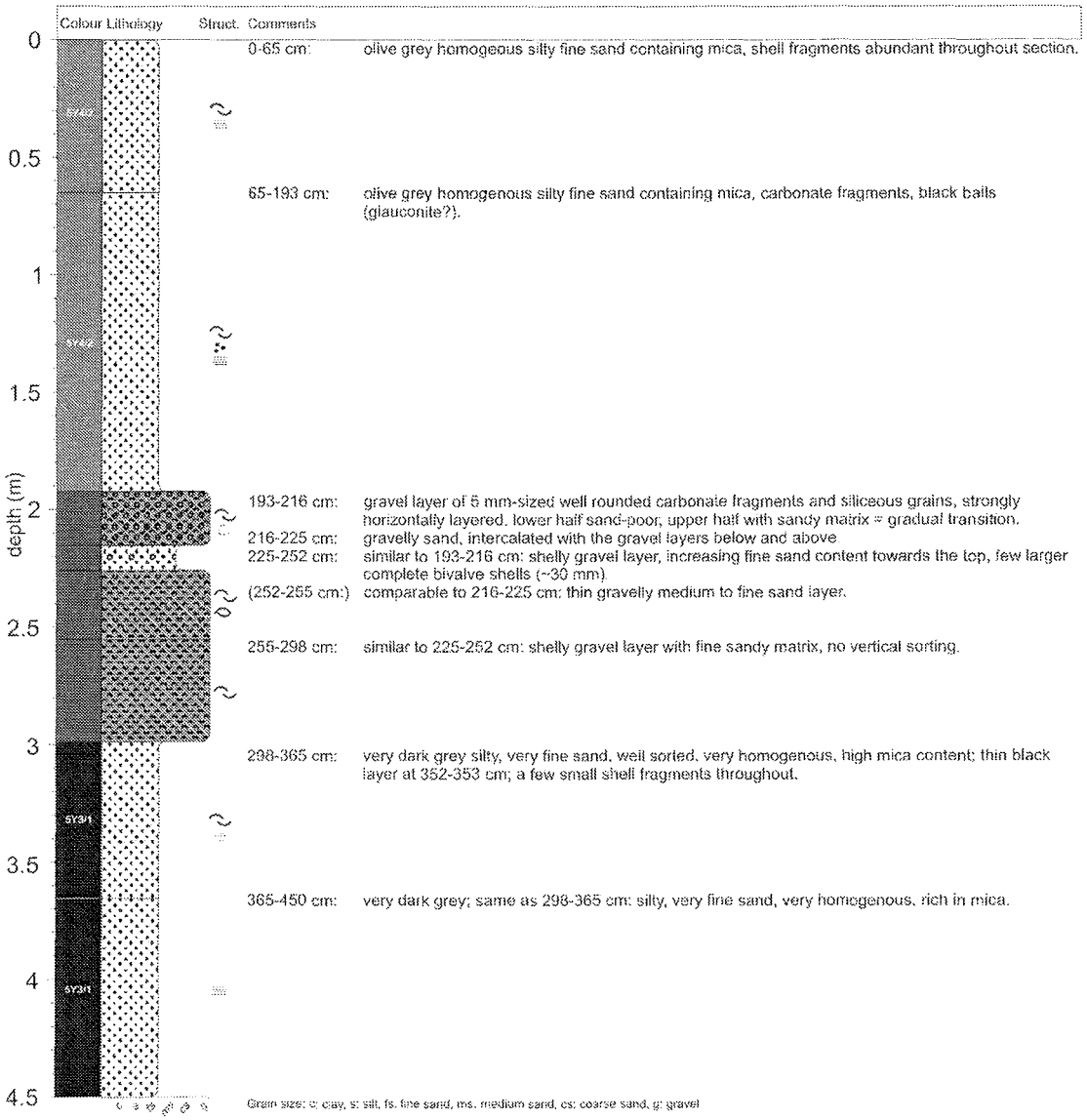
Date: 24.08.06 Pos: 42°42'29"N 9°21'07"W
Water depth: 129 m Core length: 430 cm

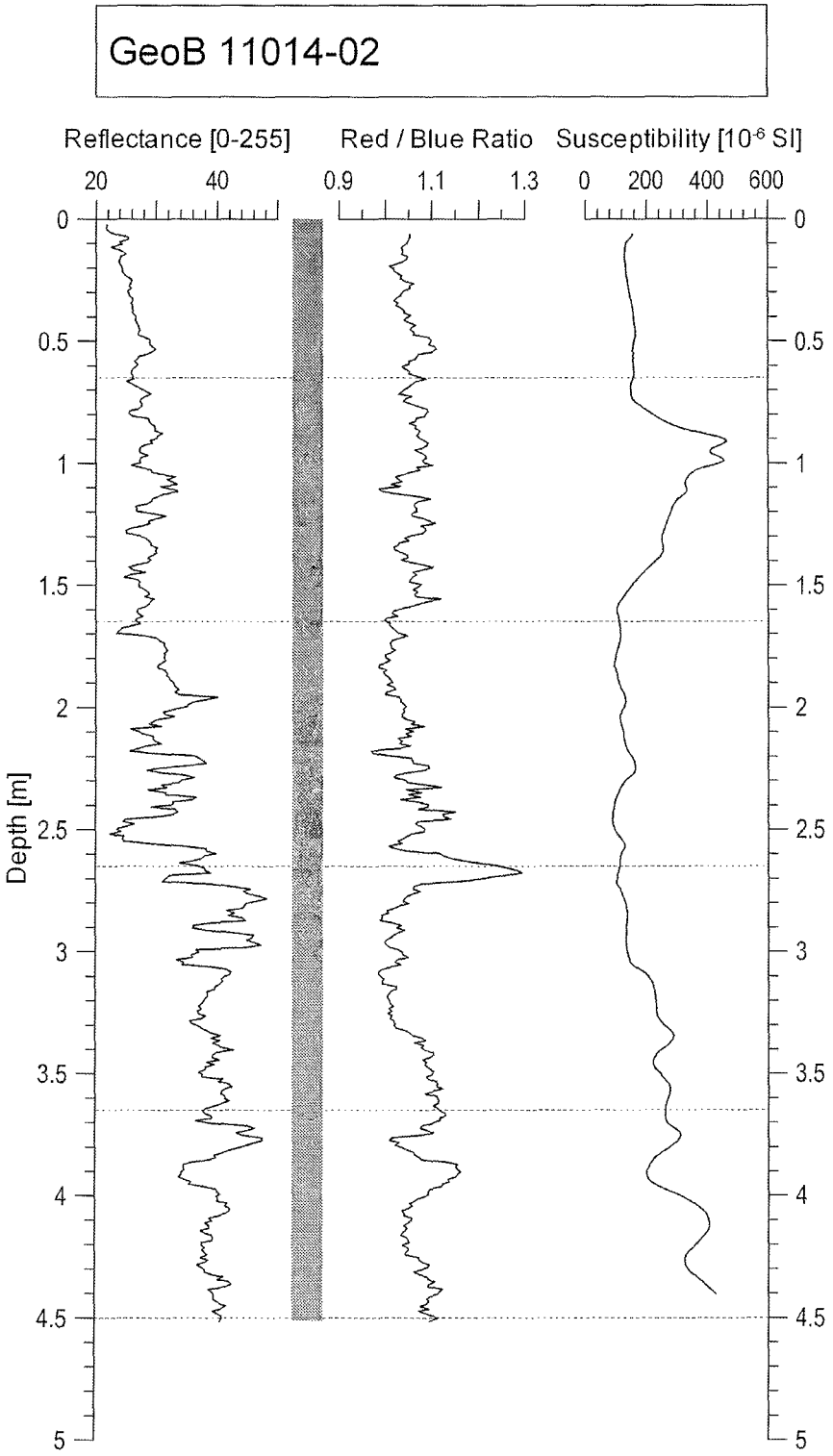


No physical properties data available

GeoB 11014-2$_{VC}$

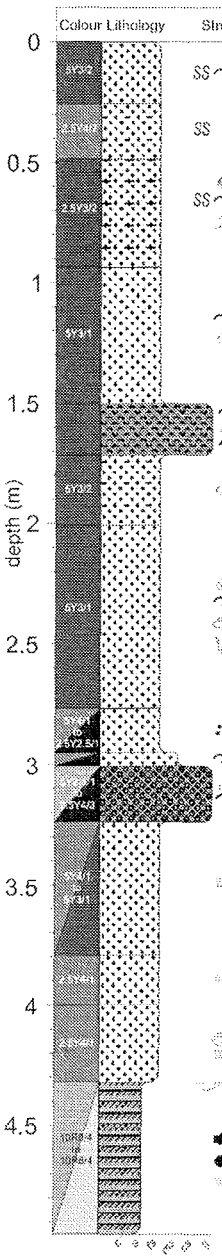
Date: 24.08.06 Pos: 42°42'30"N 9°27'39"W
Water depth: 153 m Core length: 450 cm




GeoB 11014-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
20
40
0.9
1.1
1.3
0
200
400
600
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

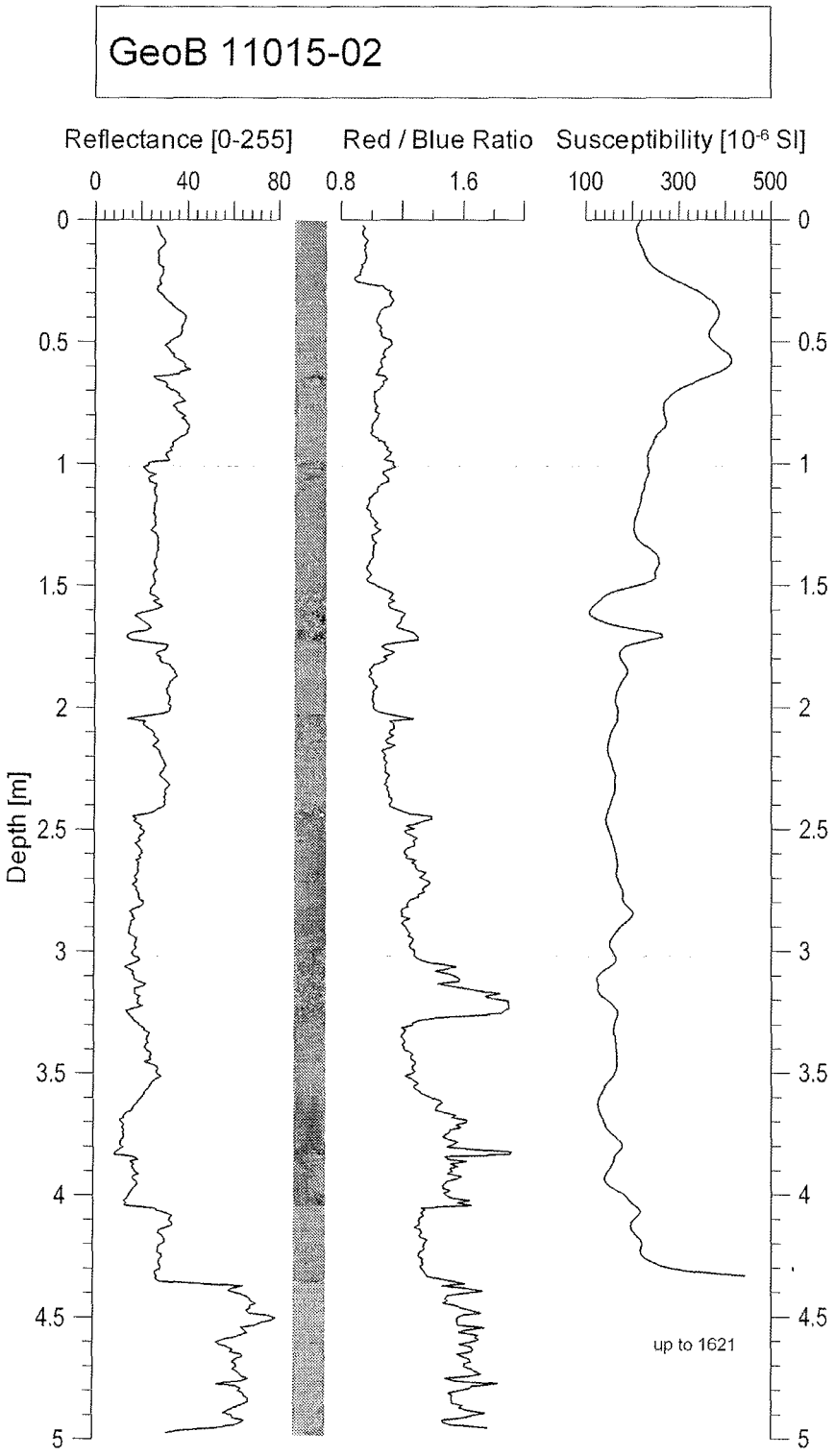
GeoB 11015-2$_{VC}$

Date: 24.08.06 Pos: 42°46'11"N 9°27'58"W
Water depth: 159 m Core length: 494 cm



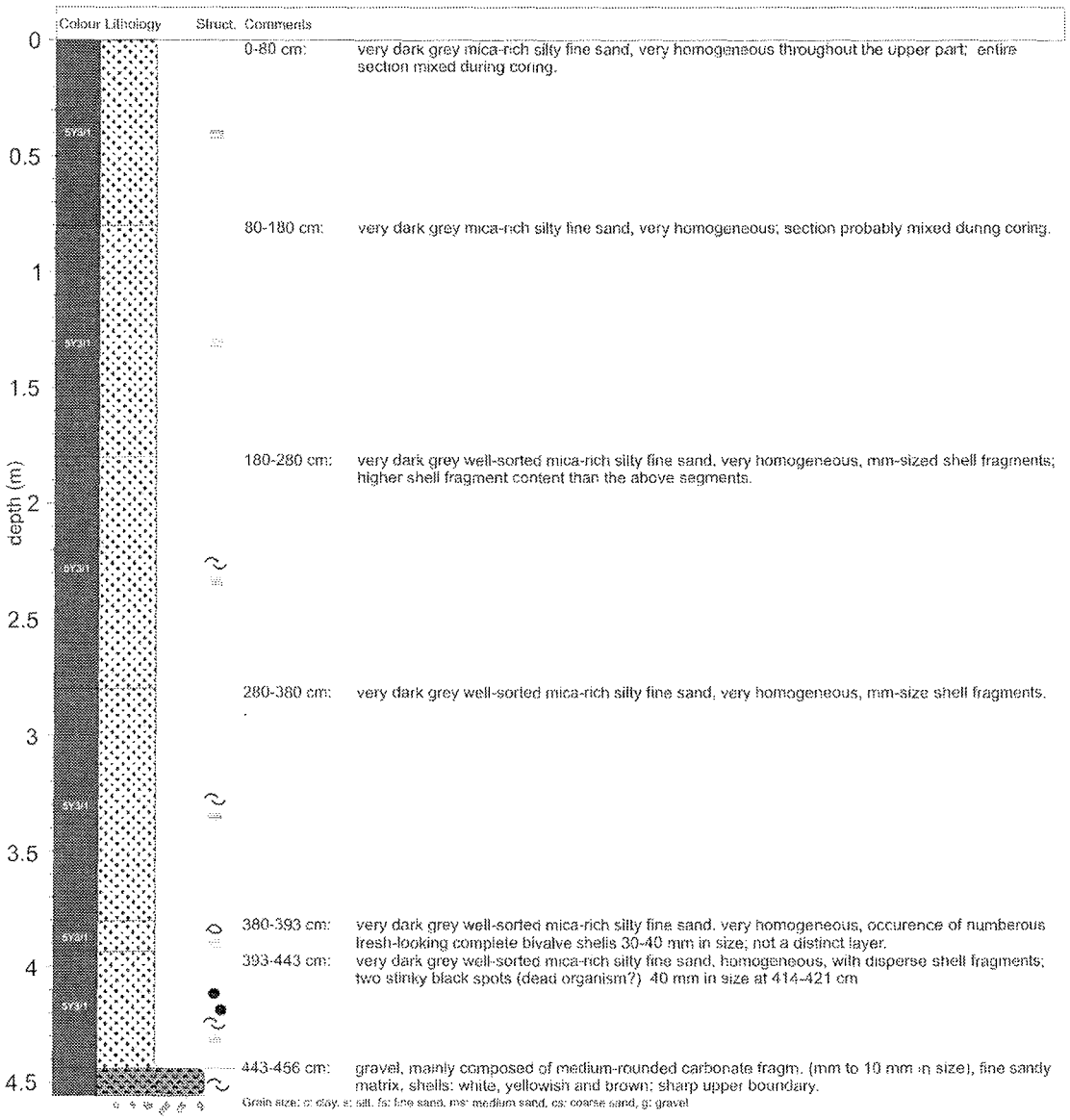
Colour Lithology	Struct.	Comments	
		0-24 cm:	dark olive grey fine sand, moderately bioturb., abundant gravel-sized shell fragments, very homogenous.
		(24-26 cm:)	black gravel layer of not-rounded carbonate fragments with fine sand as matrix.
		26-48 cm:	dark grayish brown slightly clayey fine sand, soft and wet, moderately bioturbated.
		48-93 cm:	very dark greyish brown muddy fine sand, moderately bioturbated, very homogenous, some shell fragments (5 mm in size), one oyster valve (60 mm long) at 63-64 cm depth, one chitinic worm tube (75-76 cm), some shell fragments disersely distributed.
		93-150 cm:	very dark grey silty fine sand with abundant shell fragments, slightly more silty than sequence above, some larger shells between 104-107 cm depth, homogenous.
		150-172 cm:	carbonate gravel layer with moderately rounded fragments of bivalves and scaphopodes, mm-15 mm in size, above 59 cm depth relatively well-sorted, below 159 cm depth poorly sorted with fine sandy matrix and several complete valves.
		172-201 cm:	dark olive grey slightly clayey fine sand, numerous scaphopode tubes (partly concentrated).
		201-277 cm:	dark olive grey fine sand with abundant scaphopodes either well-sorted or very poorly-sorted with clay and shell fragments up to 20 mm in size, single complete gastropod and solitary coral (244-245 cm depth).
		277-295 cm:	dark grey to black well-sorted fine sand, stratified by glauconitic and siliceous layers.
		295-301 cm:	dark grey to black poorly-sorted clayey sand full of medium-rounded shell fragments.
		301-323 cm:	black to olive brown sediment consisting of poorly-sorted siliceous gravel, fine sand and carbonate fragments (mm-20 mm in size).
		323-378 cm:	dark grey (323-364 cm depth) to very dark gray (364-378 cm) well-sorted fine sand with high mica content; above 343 cm depth, intercalations of lighter and darker material.
		(378-380 cm:)	poorly-sorted layer of shell fragments and clayey fine sand.
		380-397 cm:	dark grey well-sorted fine sand with high mica content.
		(397-401 cm.)	glauconite-rich fine sand.
		401-432 cm:	dark grey well-sorted fine sand with high mica content, some darker intercalations and clayey lenses; [14C sample at 430-431 cm].
		432-494 cm:	yellowish brown to light yellowish brown strongly overconsolidated paleosol: intercalations of clay and mica-rich silt layers, abundant organic spots, some concretions; erosive upper boundary

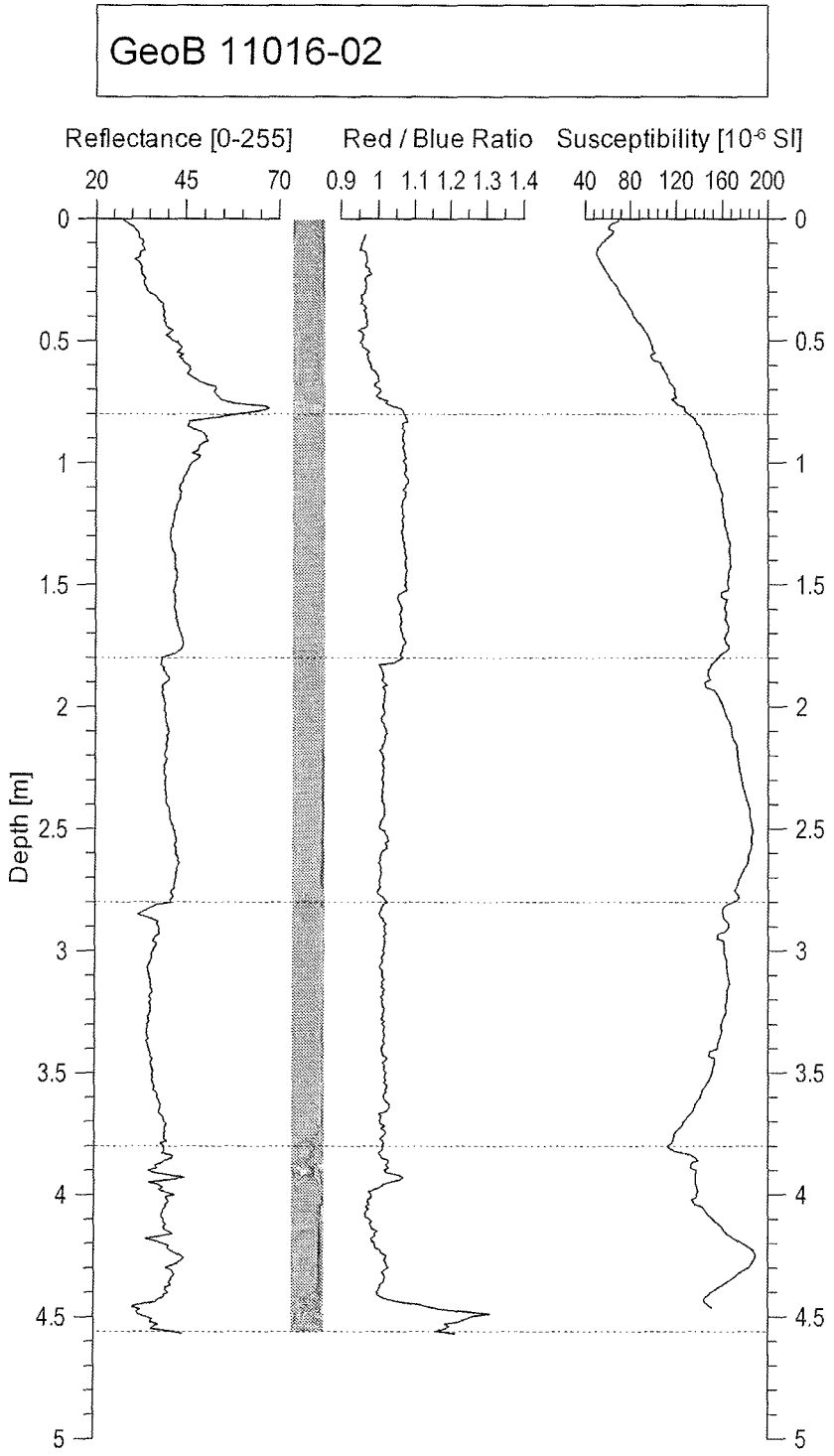
Gram size: c: clay, s: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel


GeoB 11015-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
0
40
80
0.8
1.6
100
300
500
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
up to 1621

GeoB 11016-2$_{VC}$

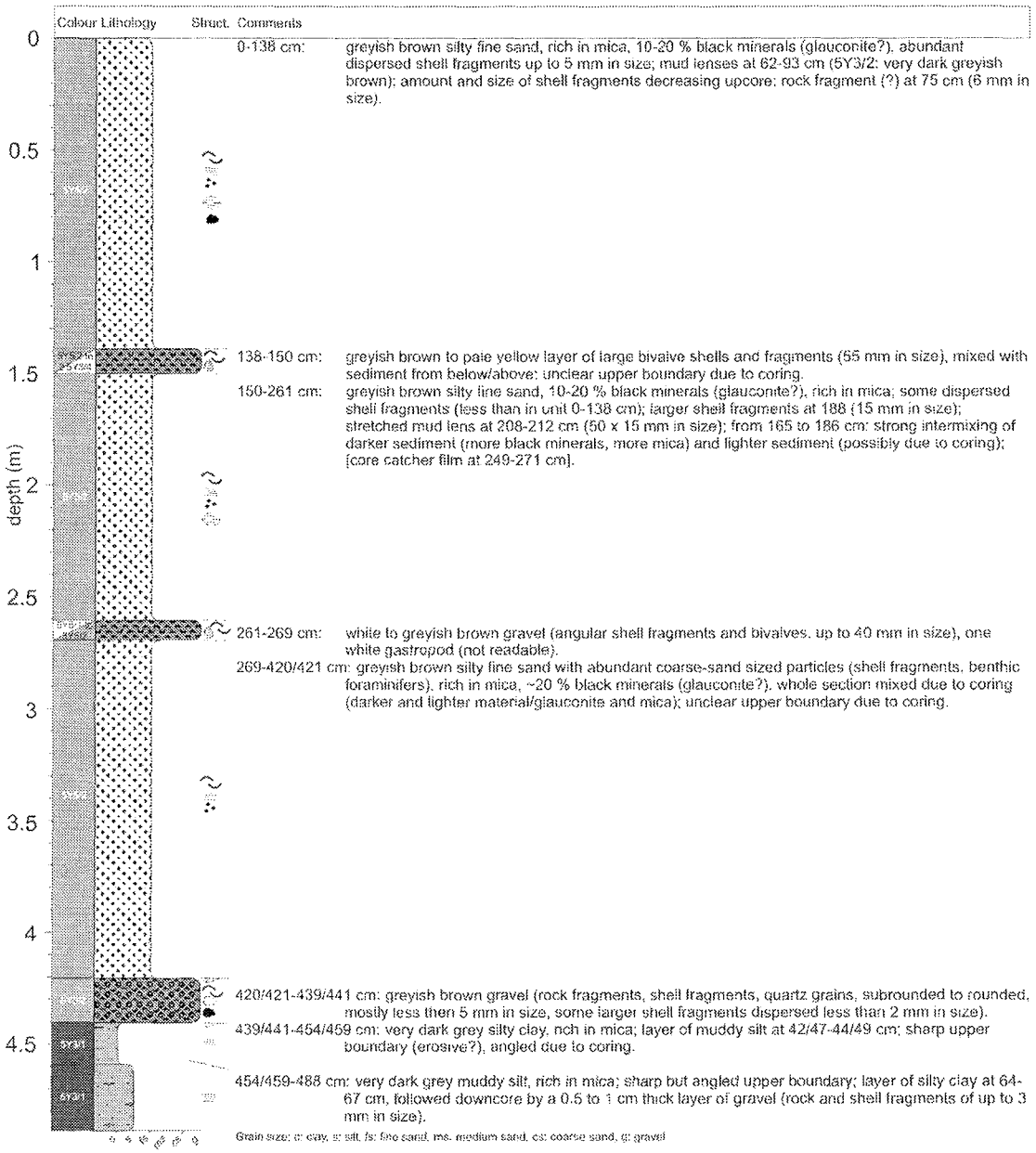
Date: 24.08.06 Pos: 42°49'00"N 9°20'60"W
Water depth: 132 m Core length: 456 cm




GeoB 11016-02
Reflectance [0-255]
20 45 70
Red / Blue Ratio
0.9 1 1.1 1.2 1.3 1.4
Susceptibility [10⁻⁶ SI]
40 80 120 160 200
Depth [m]
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5

GeoB 11017-2$_{VC}$

Date: 26.08.06 Pos: 42°31'10"N 9°14'40"W
Water depth: 120 m Core length: 488 cm



0-138 cm: greyish brown silty fine sand, rich in mica, 10-20 % black minerals (glauconite?), abundant dispersed shell fragments up to 5 mm in size; mud lenses at 62-93 cm (5Y3/2: very dark greyish brown); amount and size of shell fragments decreasing upcore; rock fragment (?) at 75 cm (6 mm in size).

138-150 cm: greyish brown to pale yellow layer of large bivalve shells and fragments (55 mm in size), mixed with sediment from below/above; unclear upper boundary due to coring.

150-261 cm: greyish brown silty fine sand, 10-20 % black minerals (glauconite?), rich in mica; some dispersed shell fragments (less than in unit 0-138 cm); larger shell fragments at 188 (15 mm in size); stretched mud lens at 208-212 cm (50 x 15 mm in size); from 165 to 186 cm: strong intermixing of darker sediment (more black minerals, more mica) and lighter sediment (possibly due to coring); [core catcher film at 249-271 cm].

261-269 cm: white to greyish brown gravel (angular shell fragments and bivalves, up to 40 mm in size), one white gastropod (not readable).

269-420/421 cm: greyish brown silty fine sand with abundant coarse-sand sized particles (shell fragments, benthic foraminifers), rich in mica, ~20 % black minerals (glauconite?), whole section mixed due to coring (darker and lighter material/glauconite and mica); unclear upper boundary due to coring.

420/421-439/441 cm: greyish brown gravel (rock fragments, shell fragments, quartz grains, subrounded to rounded, mostly less then 5 mm in size, some larger shell fragments dispersed less than 2 mm in size).

439/441-454/459 cm: very dark grey silty clay, rich in mica; layer of muddy silt at 42/47-44/49 cm; sharp upper boundary (erosive?), angled due to coring.

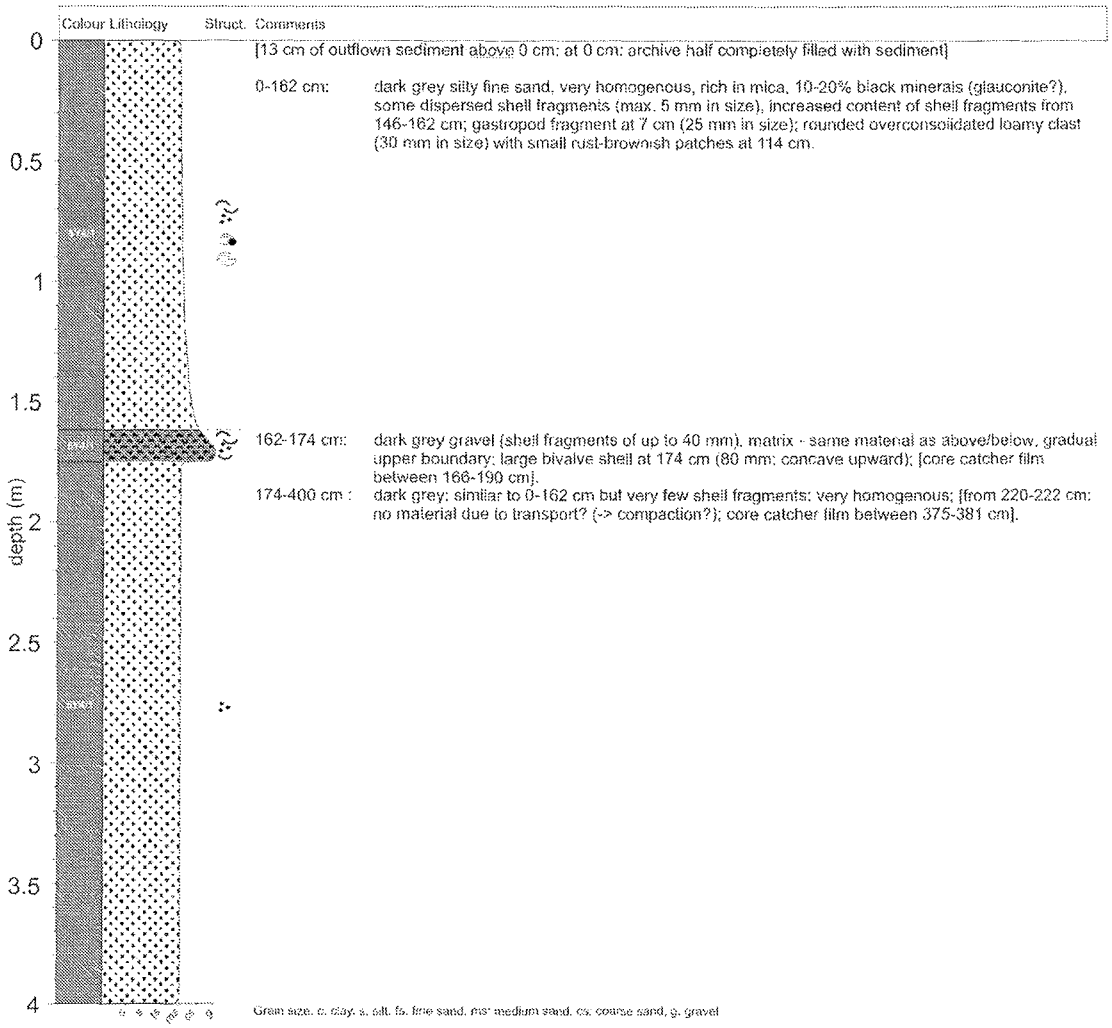
454/459-488 cm: very dark grey muddy silt, rich in mica; sharp but angled upper boundary; layer of silty clay at 64-67 cm, followed downcore by a 0.5 to 1 cm thick layer of gravel (rock and shell fragments of up to 3 mm in size).

Grain size: c: clay, si: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel

No physical properties data available

GeoB 11018-2$_{VC}$

Date: 27.08.06 Pos: 42°30'55"N 9°16'05"W
Water depth: 125 m Core length: 400 cm



[13 cm of outflown sediment above 0 cm; at 0 cm: archive half completely filled with sediment]

0-162 cm: dark grey silty fine sand, very homogenous, rich in mica, 10-20% black minerals (glauconite?), some dispersed shell fragments (max. 5 mm in size), increased content of shell fragments from 146-162 cm; gastropod fragment at 7 cm (25 mm in size); rounded overconsolidated loamy clast (30 mm in size) with small rust-brownish patches at 114 cm.

162-174 cm: dark grey gravel (shell fragments of up to 40 mm), matrix - same material as above/below, gradual upper boundary; large bivalve shell at 174 cm (80 mm; concave upward); [core catcher film between 166-190 cm].

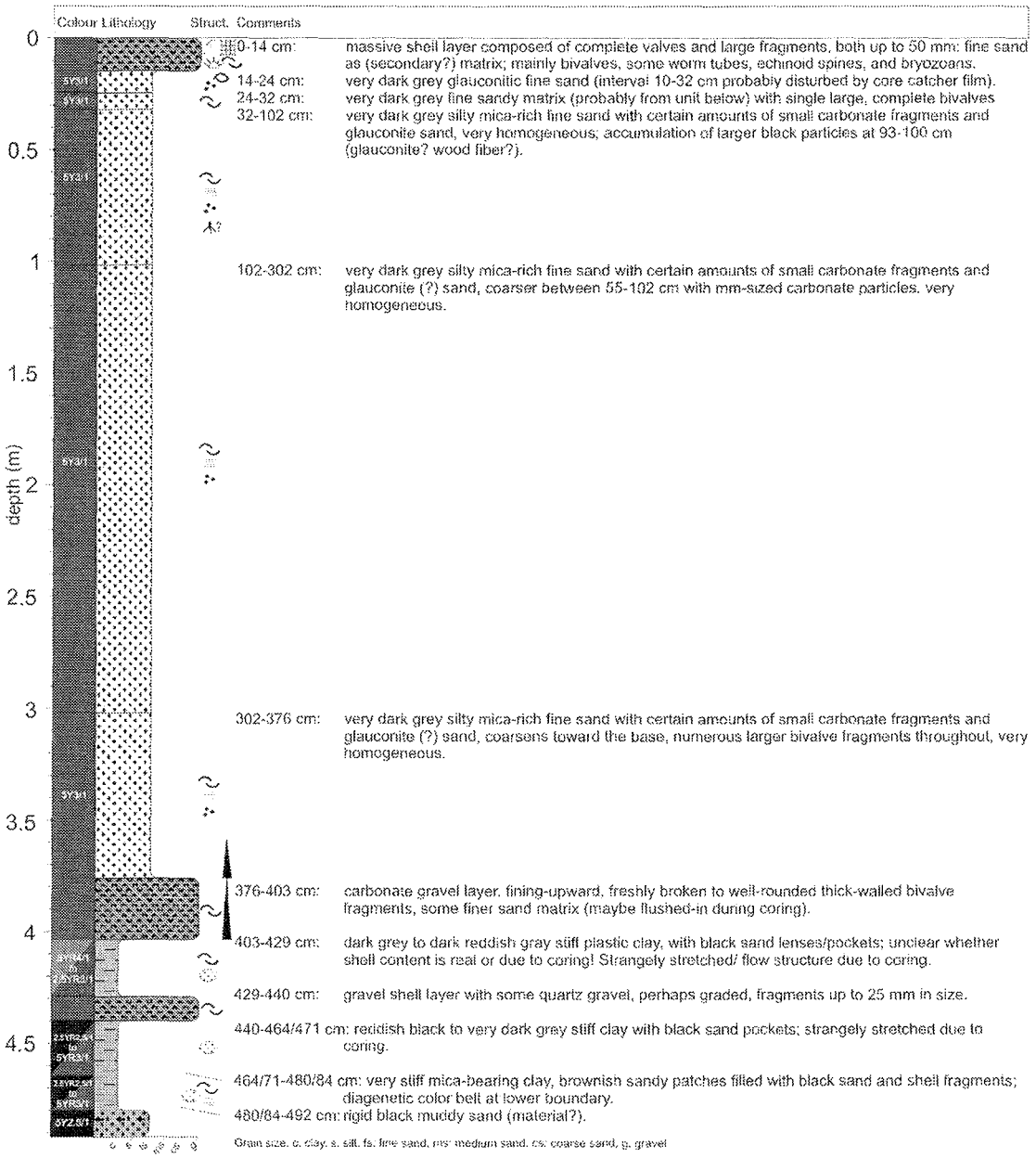
174-400 cm : dark grey; similar to 0-162 cm but very few shell fragments; very homogenous; [from 220-222 cm: no material due to transport? (-> compaction?); core catcher film between 375-381 cm].

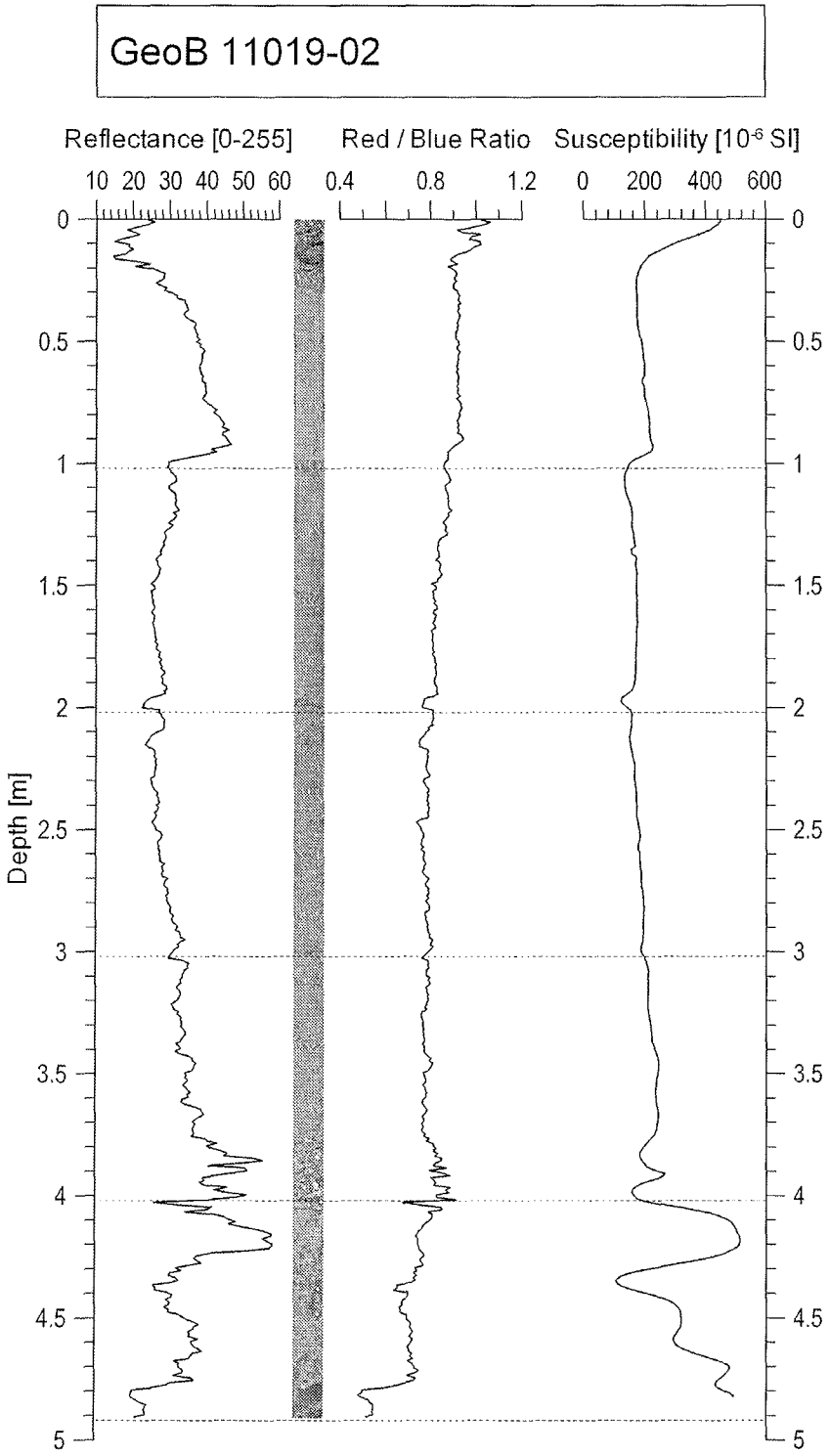
Grain size: c, clay; s, silt; fs, fine sand; ms, medium sand; cs, coarse sand; g, gravel

No physical properties data available

GeoB 11019-2$_{VC}$

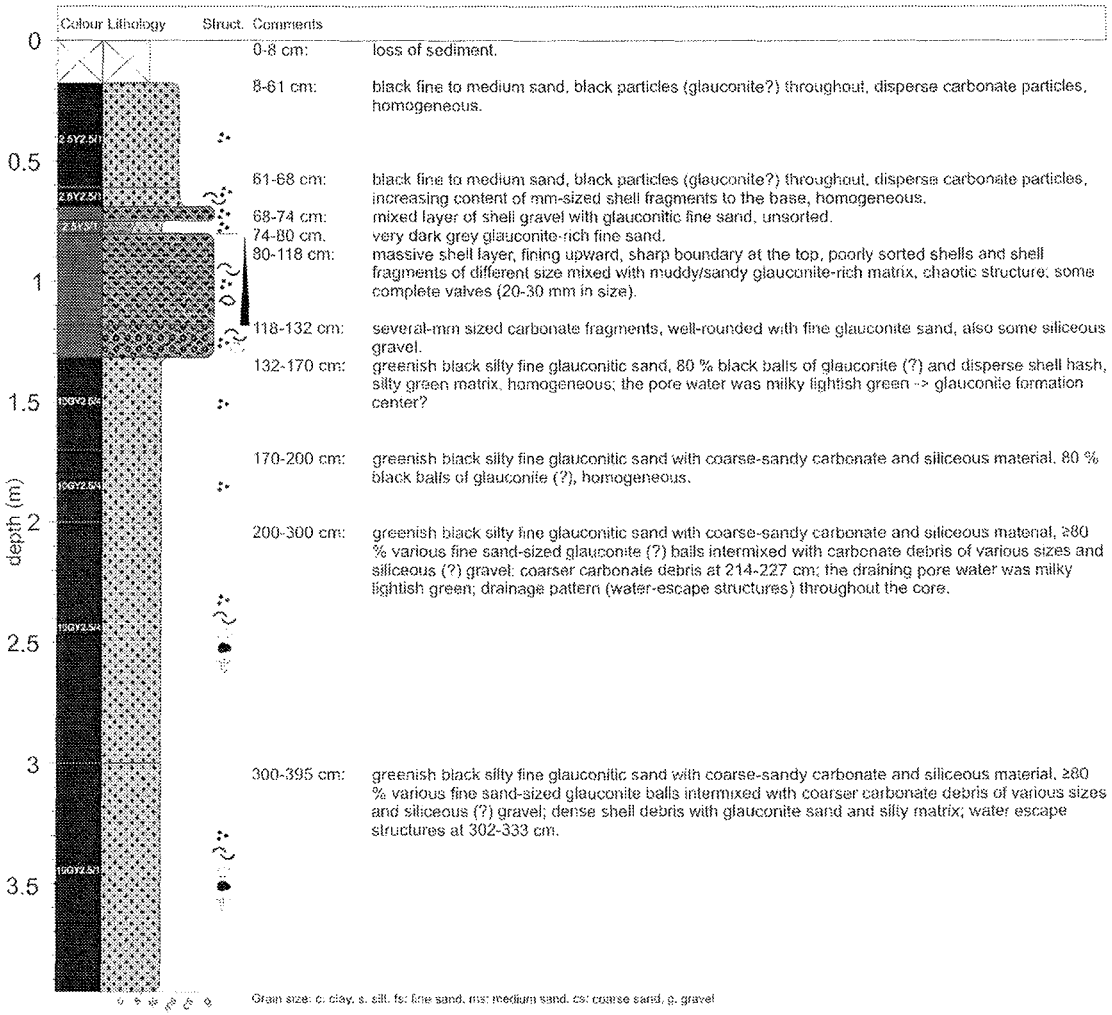
Date: 27.08.06 Pos: 42°30'28"N 9°18'16"W
Water depth: 149 m Core length: 492 cm

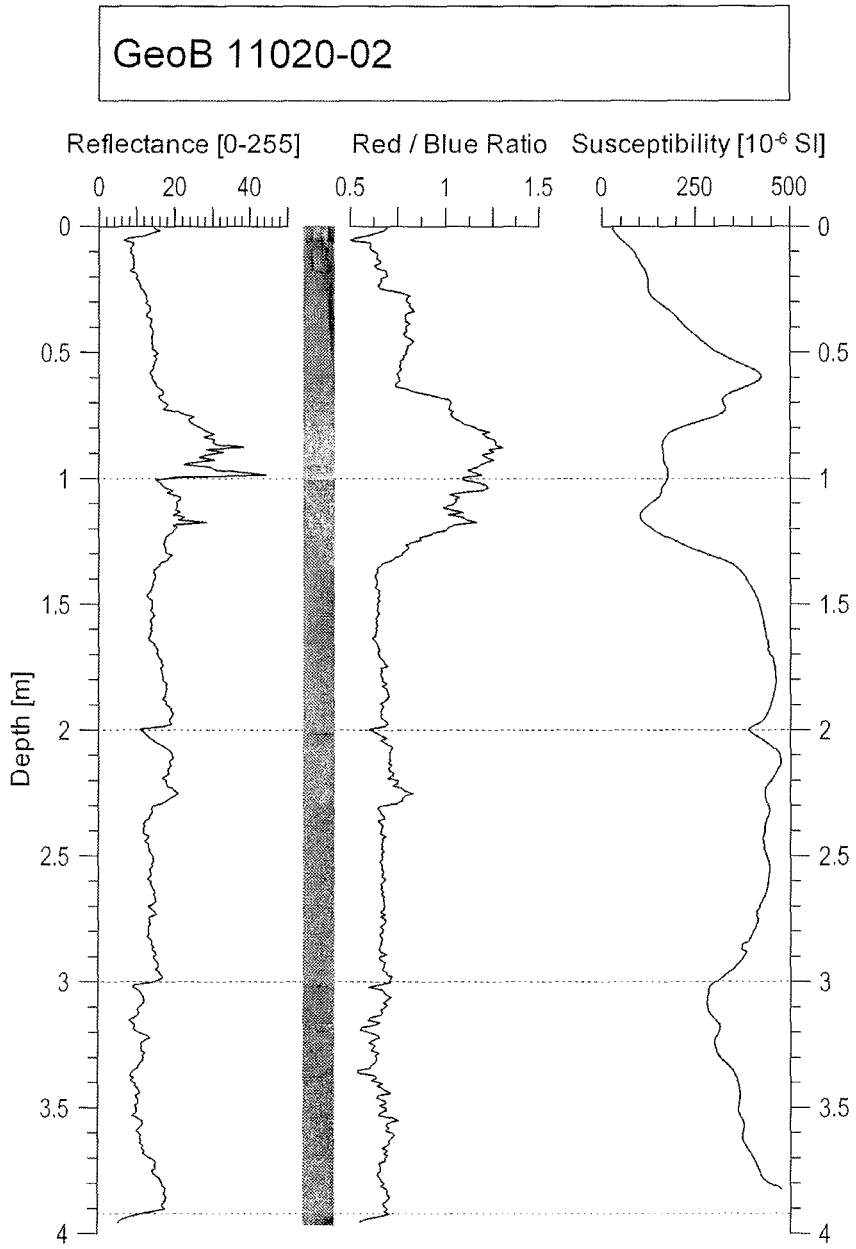



GeoB 11019-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
10 20 30 40 50 60
0.4 0.8 1.2
0 200 400 600
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

GeoB 11020-2$_{VC}$

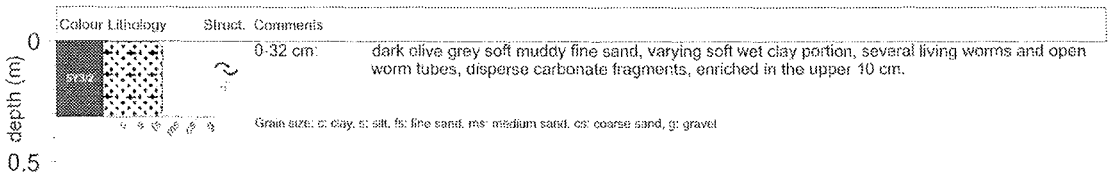
Date: 27.08.06 Pos: 42°30'23"N 9°18'53"W
Water depth: 154 m Core length: 395 cm




GeoB 11020-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
0
20
40
0.5
1
1.5
0
250
500
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4

GeoB 11022-2$_{GC}$

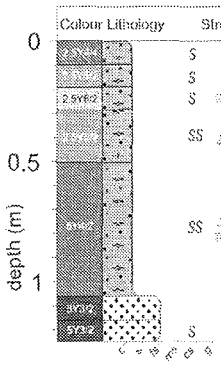
Date: 26.08.06 Pos: 42°34'59"N 9°25'18"W
Water depth: 292 m Core length: 32 cm



No physical properties data available

GeoB 11024-2$_{GC}$

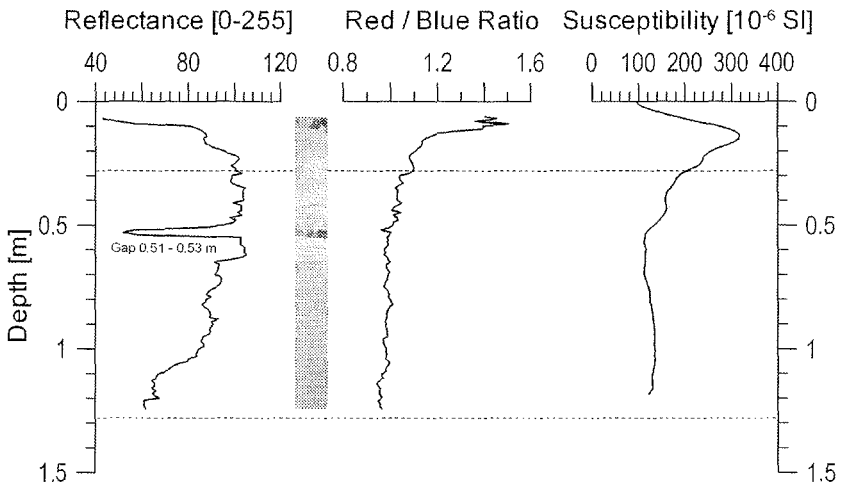
Date: 26.08.06 Pos: 42°41'46"N 9°45'00"W
Water depth: 1823 m Core length: 124 cm



Colour Lithology	Struct.	Comments	
	S	0-2 cm:	dark olive brown very soft muddy fine sand.
	S	2-10 cm:	olive brown very soft slightly sandy mud.
	S	10-19 cm:	greyish brown sticky slightly sandy mud.
		19-28 cm:	sticky foraminiferal mud, some mica.
	SS	28-61 cm:	light brownish grey to greyish brown, same as above: sticky foraminferal mud, moderately bioturbated, some larger burrow horizontally oriented; at 50-53 cm: dark greyish brown loose fine sand, siliceous, with black minerals (glauconite) and carbonate.
		61-106 cm:	olive grey, same as 28-50 cm but with some open burrows, higher mica content; moderately bioturbated, single Zoophycos burrows.
	SS		
		106-116 cm:	dark olive grey silty fine sand, homogeneous.
	S	116-124 cm:	dark olive grey silty fine sand, with certain clay content, some clay lenses.

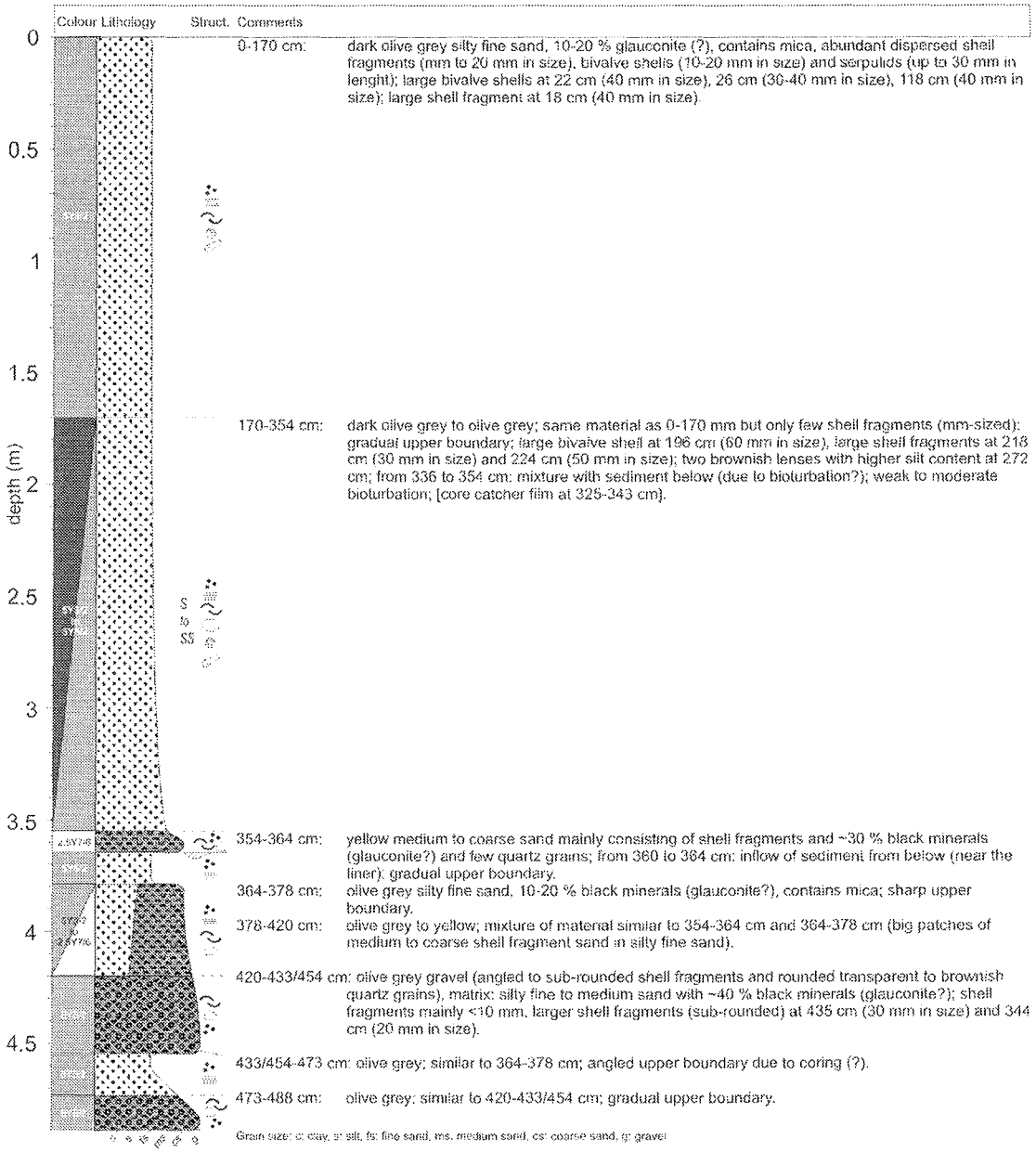
Grain size: c: clay, s: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel

GeoB 11024-02



GeoB 11025-2$_{VC}$

Date: 27.08.06 Pos: 42°38'04"N 9°21'19"W
Water depth: 131 m Core length: 488 cm



0-170 cm: dark olive grey silty fine sand, 10-20 % glauconite (?), contains mica, abundant dispersed shell fragments (mm to 20 mm in size), bivalve shells (10-20 mm in size) and serpulids (up to 30 mm in lenght); large bivalve shells at 22 cm (40 mm in size), 26 cm (30-40 mm in size), 118 cm (40 mm in size); large shell fragment at 18 cm (40 mm in size).

170-354 cm: dark olive grey to olive grey; same material as 0-170 mm but only few shell fragments (mm-sized); gradual upper boundary; large bivalve shell at 196 cm (60 mm in size), large shell fragments at 218 cm (30 mm in size) and 224 cm (50 mm in size); two brownish lenses with higher silt content at 272 cm; from 336 to 354 cm: mixture with sediment below (due to bioturbation?); weak to moderate bioturbation; [core catcher film at 325-343 cm].

354-364 cm: yellow medium to coarse sand mainly consisting of shell fragments and ~30 % black minerals (glauconite?) and few quartz grains; from 360 to 364 cm: inflow of sediment from below (near the liner); gradual upper boundary.

364-378 cm: olive grey silty fine sand, 10-20 % black minerals (glauconite?), contains mica; sharp upper boundary.

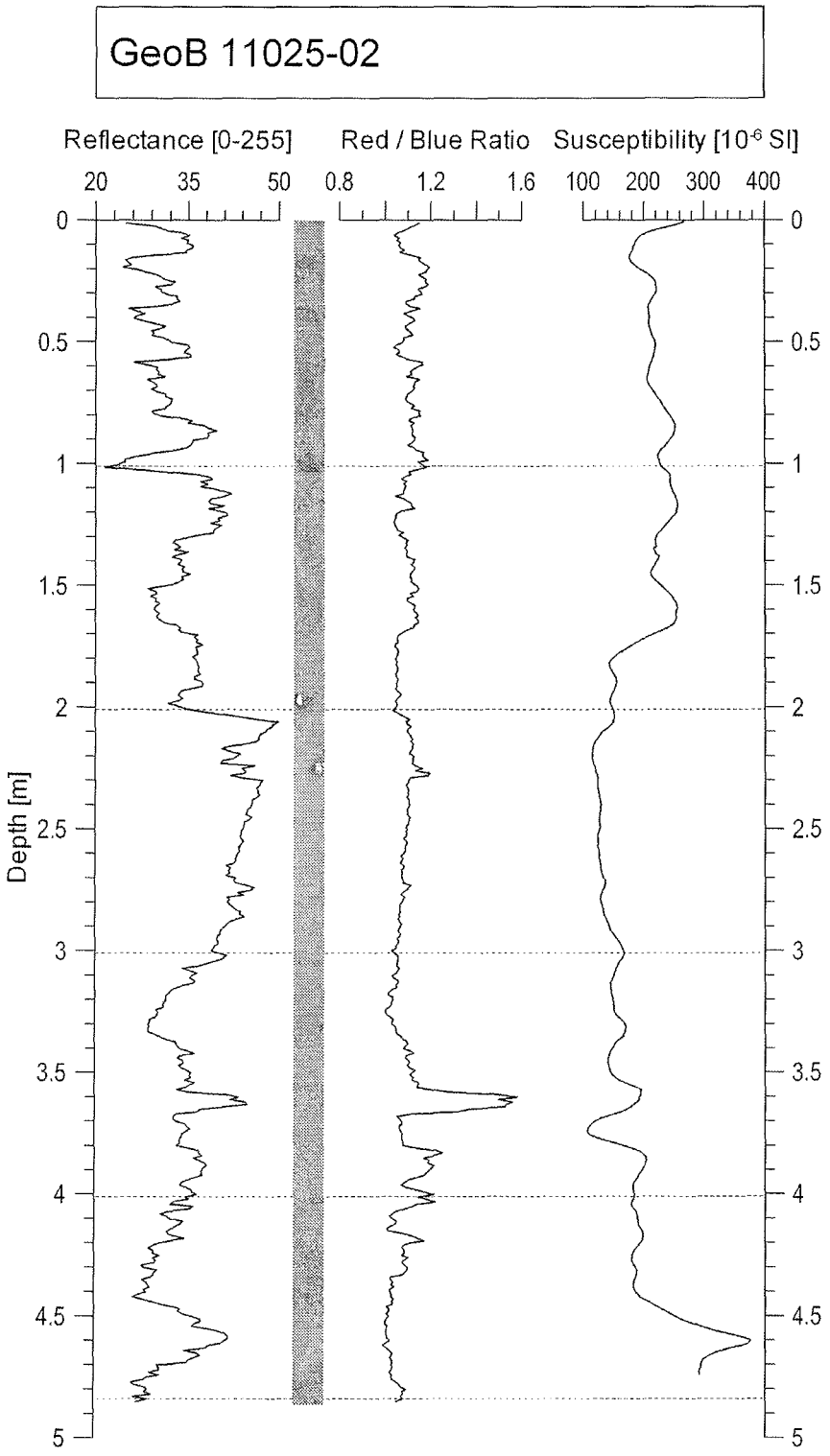
378-420 cm: olive grey to yellow; mixture of material similar to 354-364 cm and 364-378 cm (big patches of medium to coarse shell fragment sand in silty fine sand).

420-433/454 cm: olive grey gravel (angled to sub-rounded shell fragments and rounded transparent to brownish quartz grains), matrix: silty fine to medium sand with ~40 % black minerals (glauconite?); shell fragments mainly <10 mm, larger shell fragments (sub-rounded) at 435 cm (30 mm in size) and 344 cm (20 mm in size).

433/454-473 cm: olive grey; similar to 364-378 cm; angled upper boundary due to coring (?).

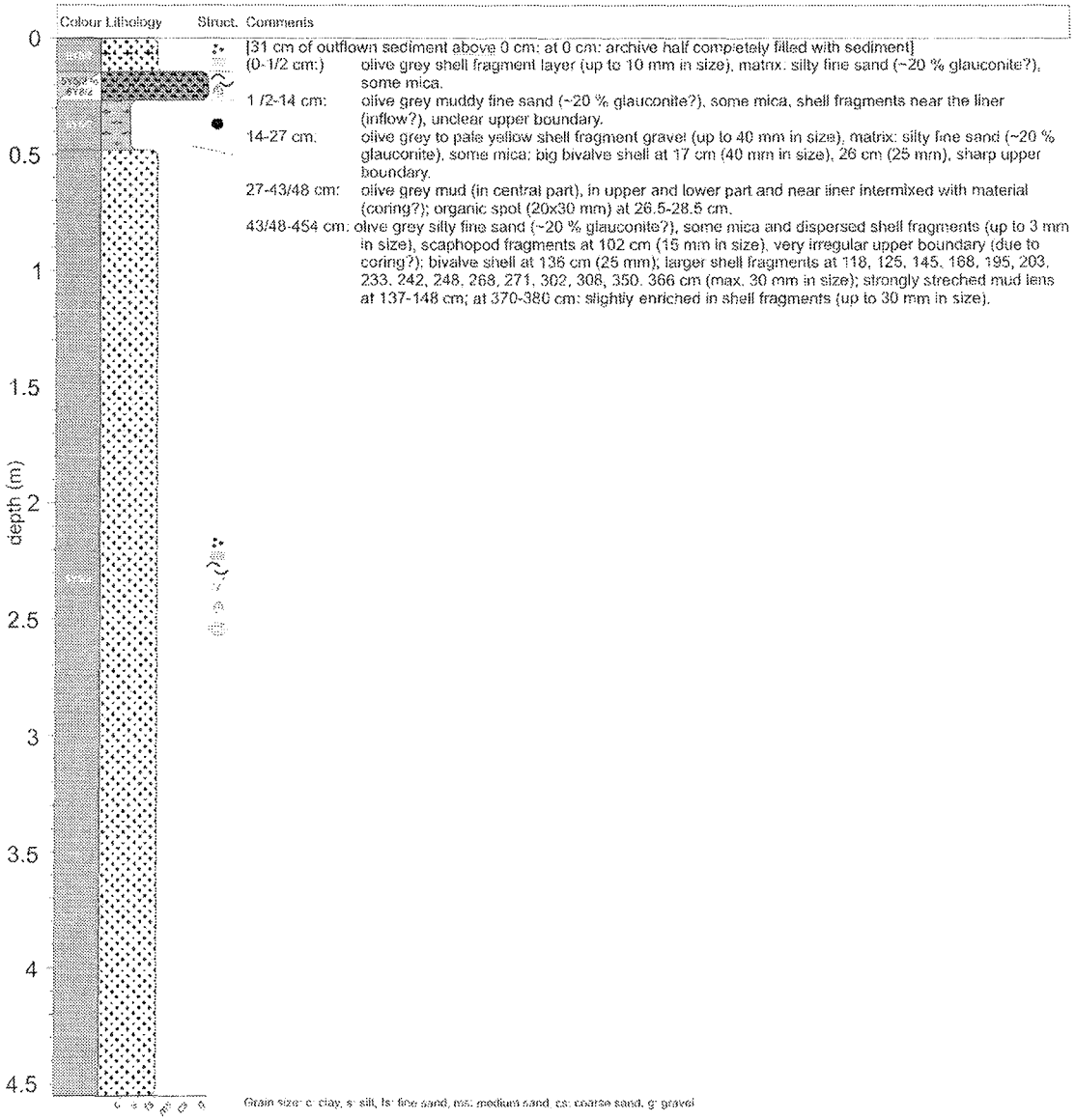
473-488 cm: olive grey; similar to 420-433/454 cm; gradual upper boundary.

Grain size: c: clay, si: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel

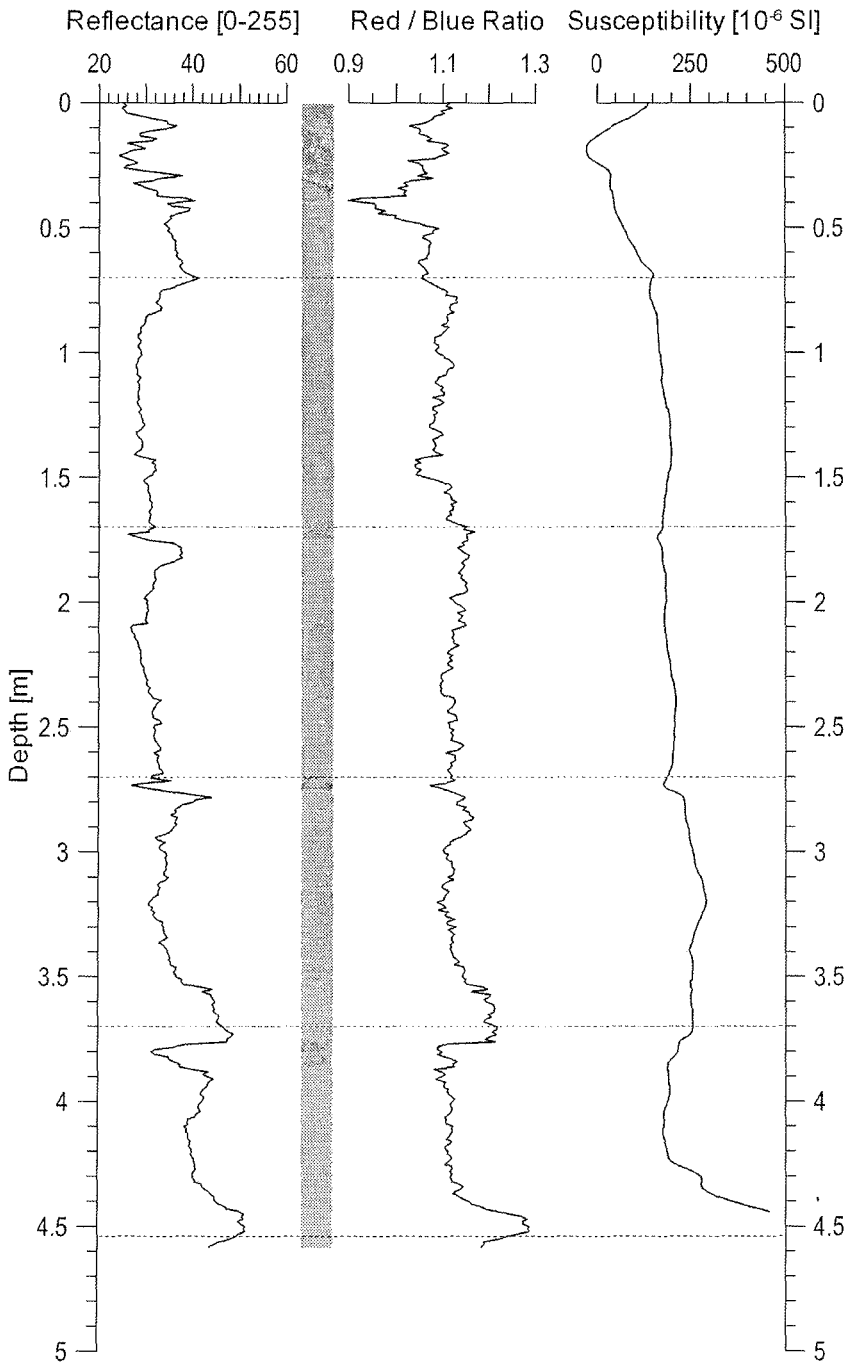

GeoB 11025-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
20
35
50
0.8
1.2
1.6
100
200
300
400
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

GeoB 11027-2$_{VC}$

Date: 29.08.06 Pos: 41°57'60"N 9°10'35"W
Water depth: 136 m Core length: 454 cm

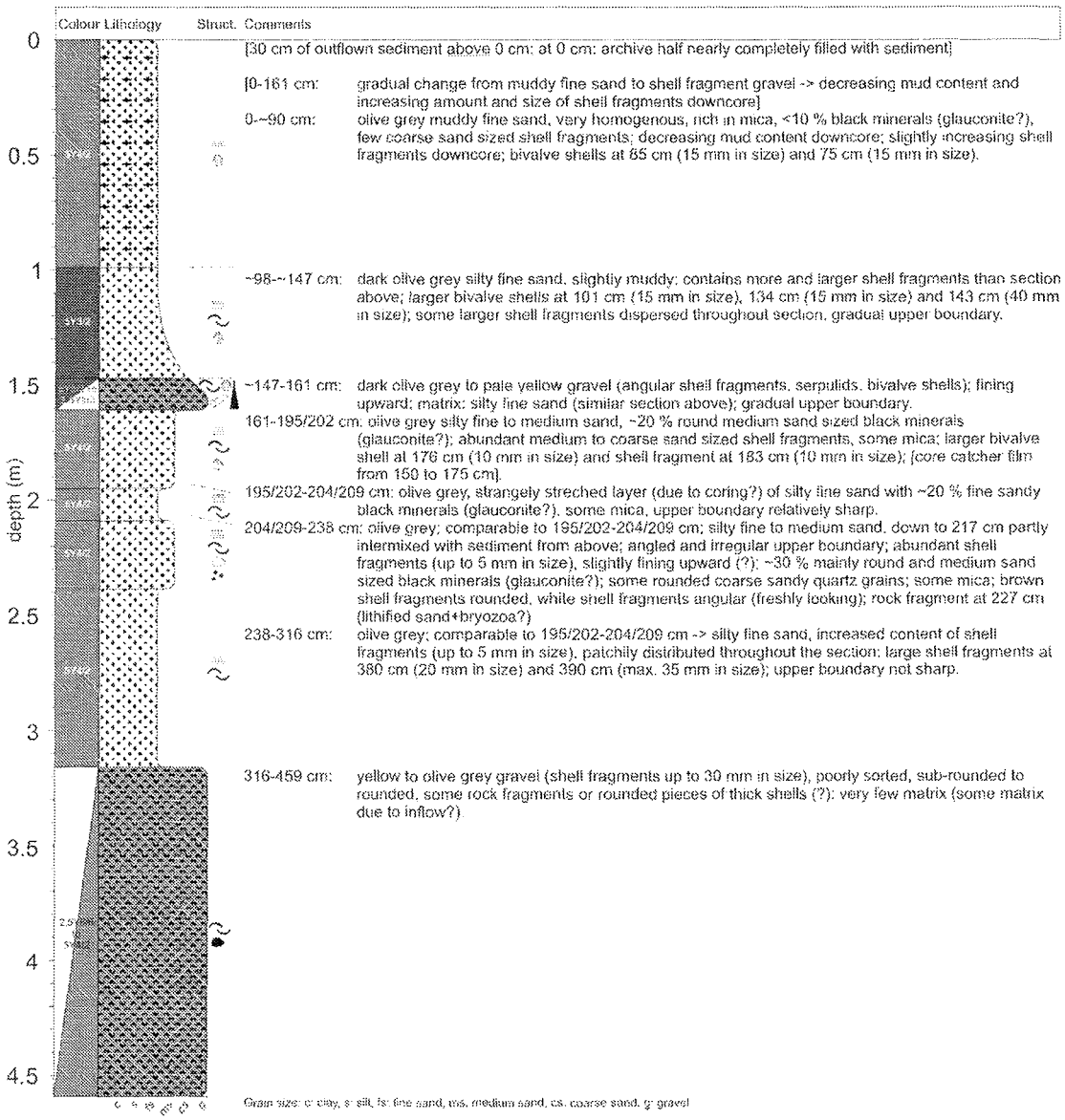


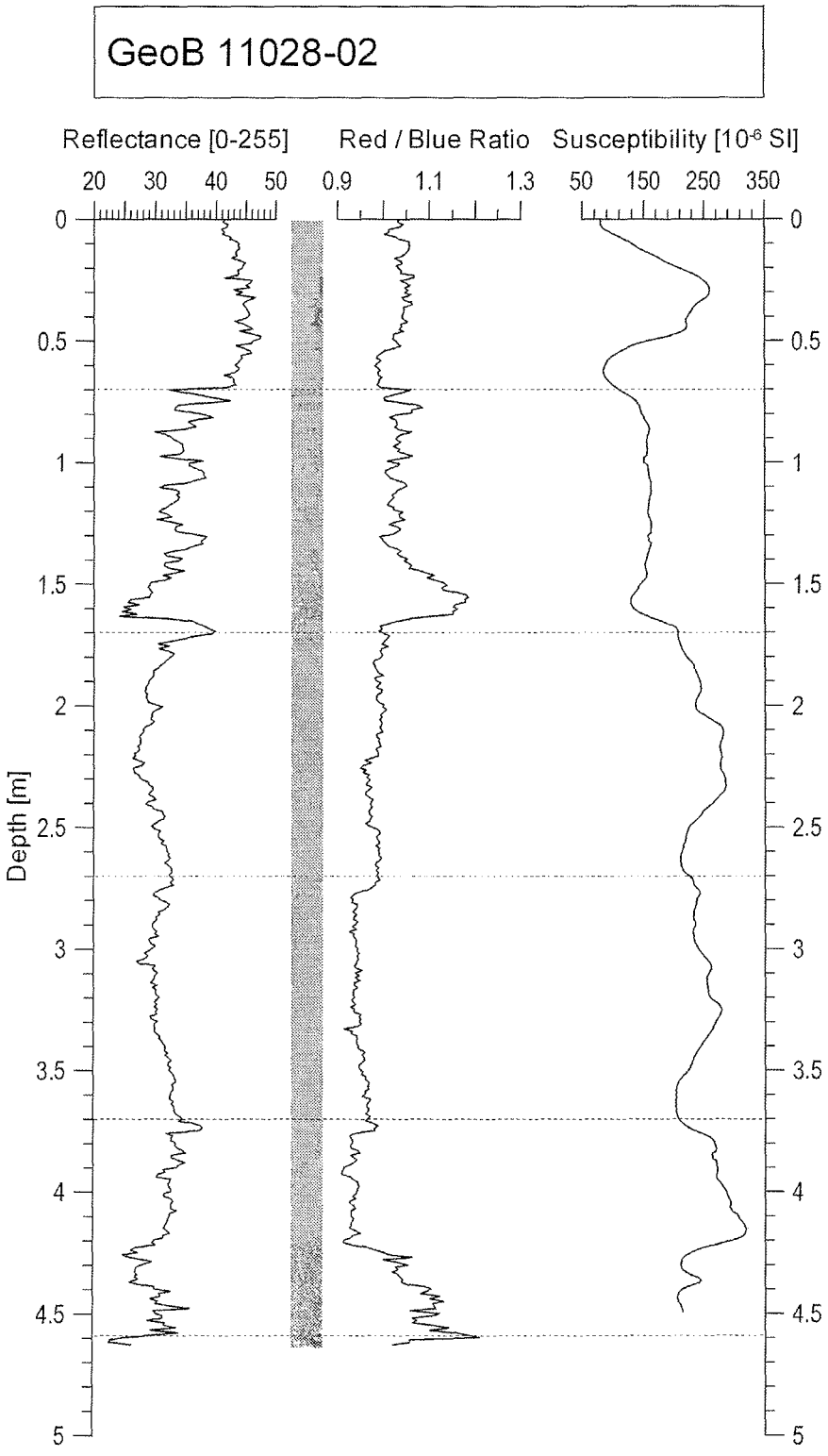
GeoB 11027-02



GeoB 11028-2$_{VC}$

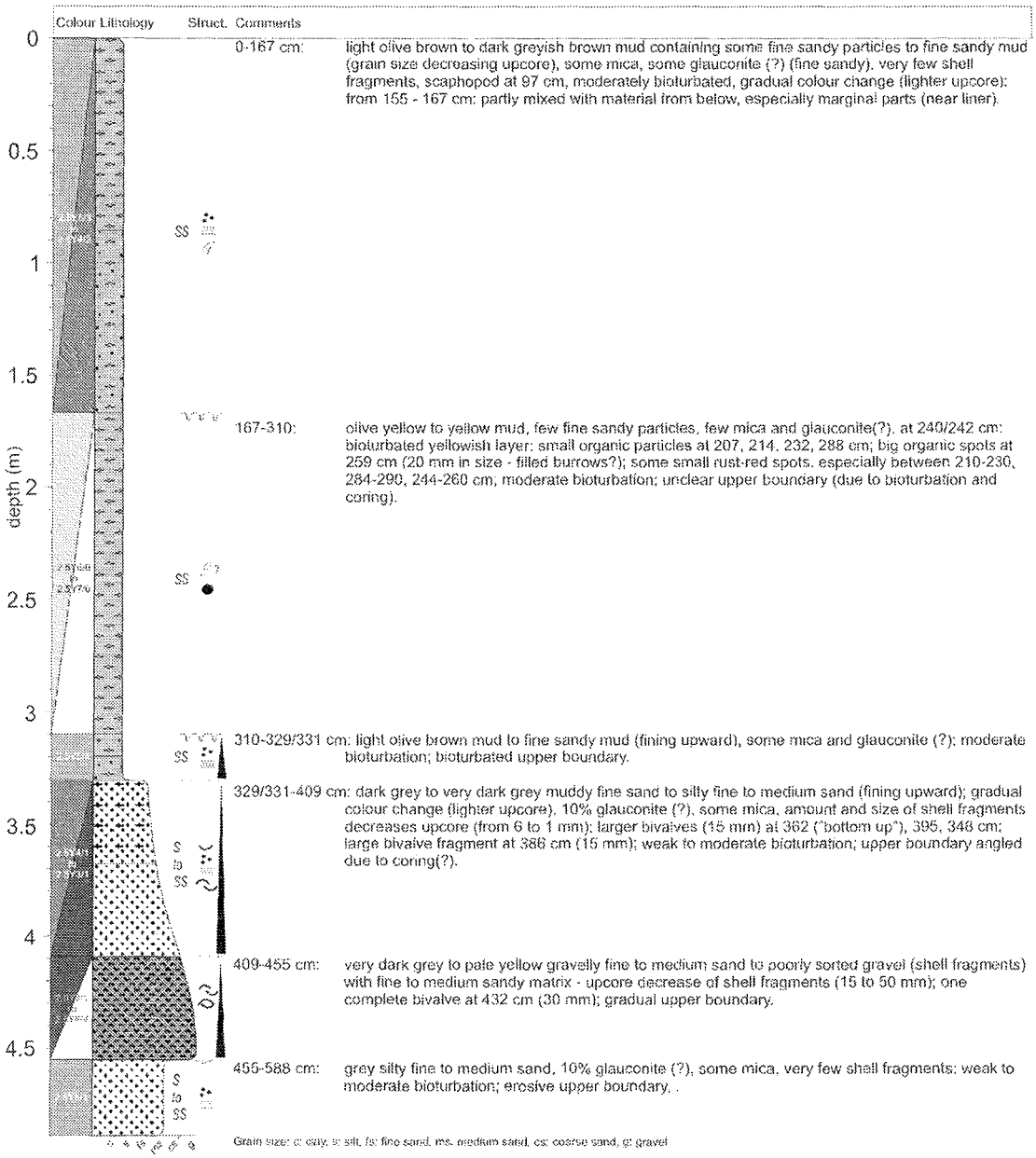
Date: 29.08.06 Pos: 41°57'60"N 9°05'30"W
Water depth: 127 m Core length: 459 cm




GeoB 11028-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
20 30 40 50
0.9 1.1 1.3
50 150 250 350
Depth [m]
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5

GeoB 11029-2$_{VC}$

Date: 29.08.06 Pos: 41°57'60"N 9°02'42"W
Water depth: 114 m Core length: 488 cm



0-167 cm: light olive brown to dark greyish brown mud containing some fine sandy particles to fine sandy mud (grain size decreasing upcore), some mica, some glauconite (?) (fine sandy), very few shell fragments, scaphopod at 97 cm, moderately bioturbated, gradual colour change (lighter upcore); from 155 - 167 cm: partly mixed with material from below, especially marginal parts (near liner).

167-310: olive yellow to yellow mud, few fine sandy particles, few mica and glauconite(?), at 240/242 cm: bioturbated yellowish layer: small organic particles at 207, 214, 232, 288 cm; big organic spots at 259 cm (20 mm in size - filled burrows?); some small rust-red spots, especially between 210-230, 284-290, 244-260 cm; moderate bioturbation; unclear upper boundary (due to bioturbation and coring).

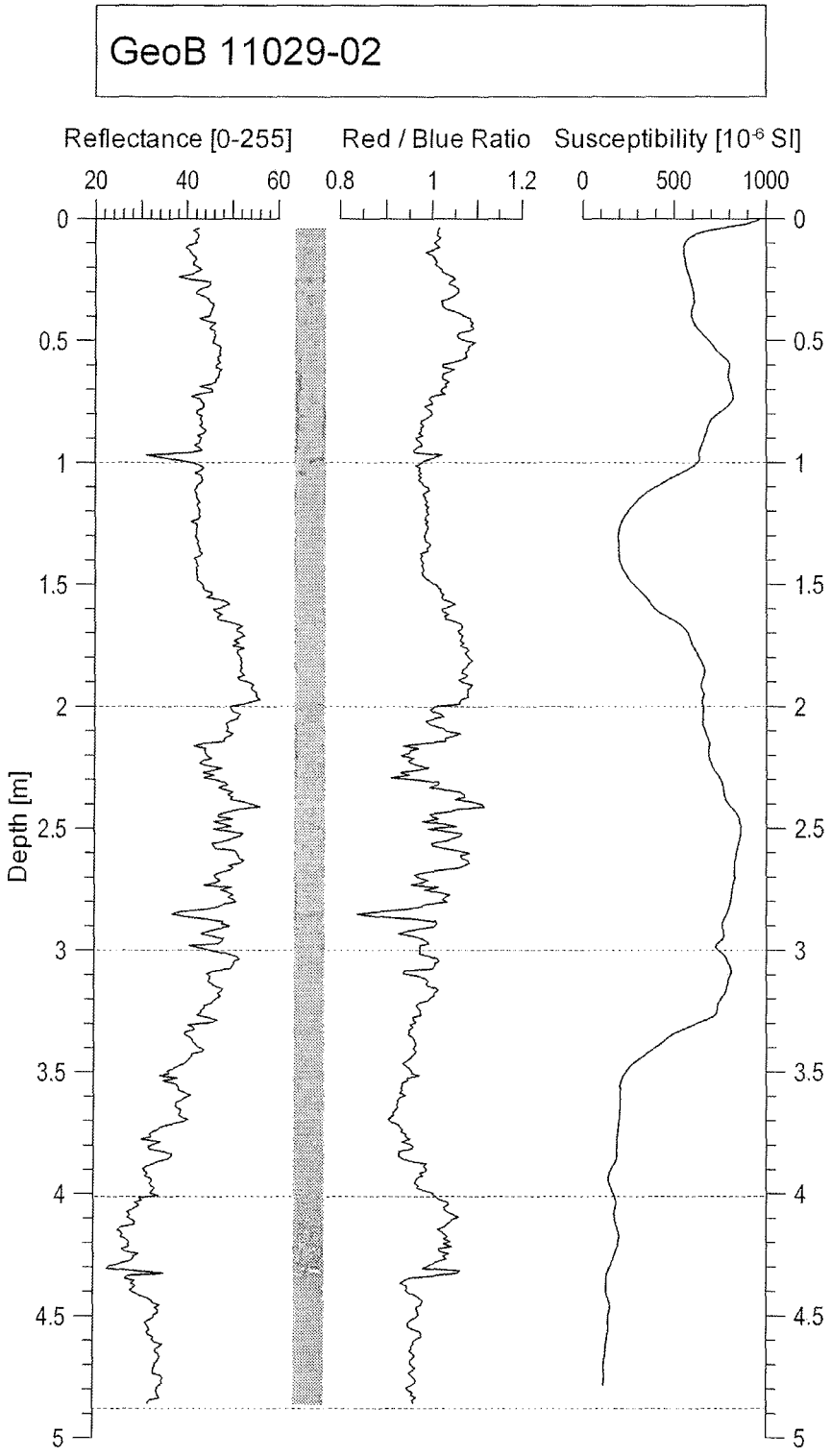
310-329/331 cm: light olive brown mud to fine sandy mud (fining upward), some mica and glauconite (?); moderate bioturbation; bioturbated upper boundary.

329/331-409 cm: dark grey to very dark grey muddy fine sand to silty fine to medium sand (fining upward); gradual colour change (lighter upcore), 10% glauconite (?), some mica, amount and size of shell fragments decreases upcore (from 6 to 1 mm); larger bivalves (15 mm) at 362 ("bottom up"), 395, 346 cm; large bivalve fragment at 386 cm (15 mm); weak to moderate bioturbation; upper boundary angled due to coring(?).

409-455 cm: very dark grey to pale yellow gravelly fine to medium sand to poorly sorted gravel (shell fragments) with fine to medium sandy matrix - upcore decrease of shell fragments (15 to 50 mm); one complete bivalve at 432 cm (30 mm); gradual upper boundary.

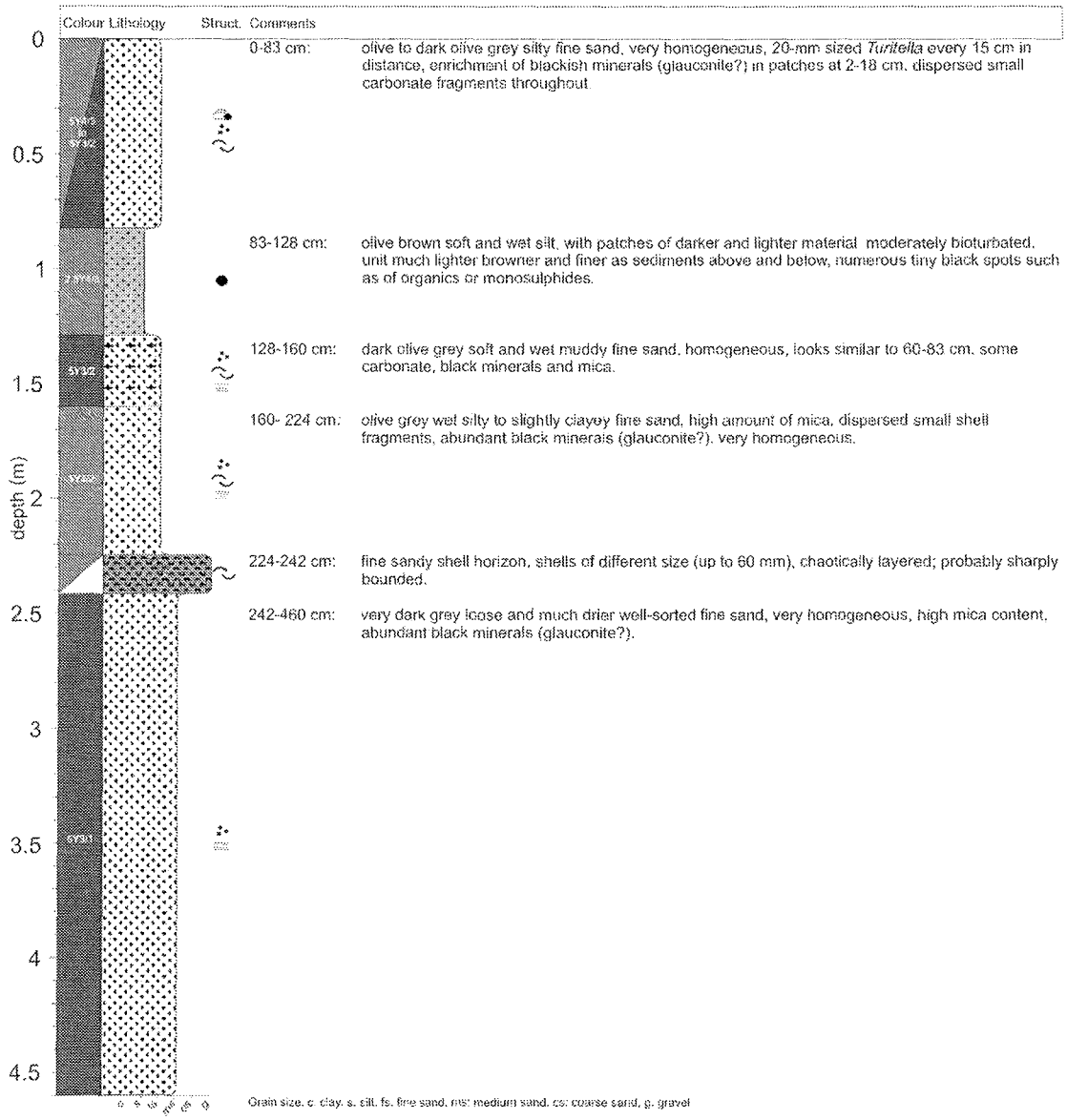
455-588 cm: grey silty fine to medium sand, 10% glauconite (?), some mica, very few shell fragments; weak to moderate bioturbation; erosive upper boundary, .

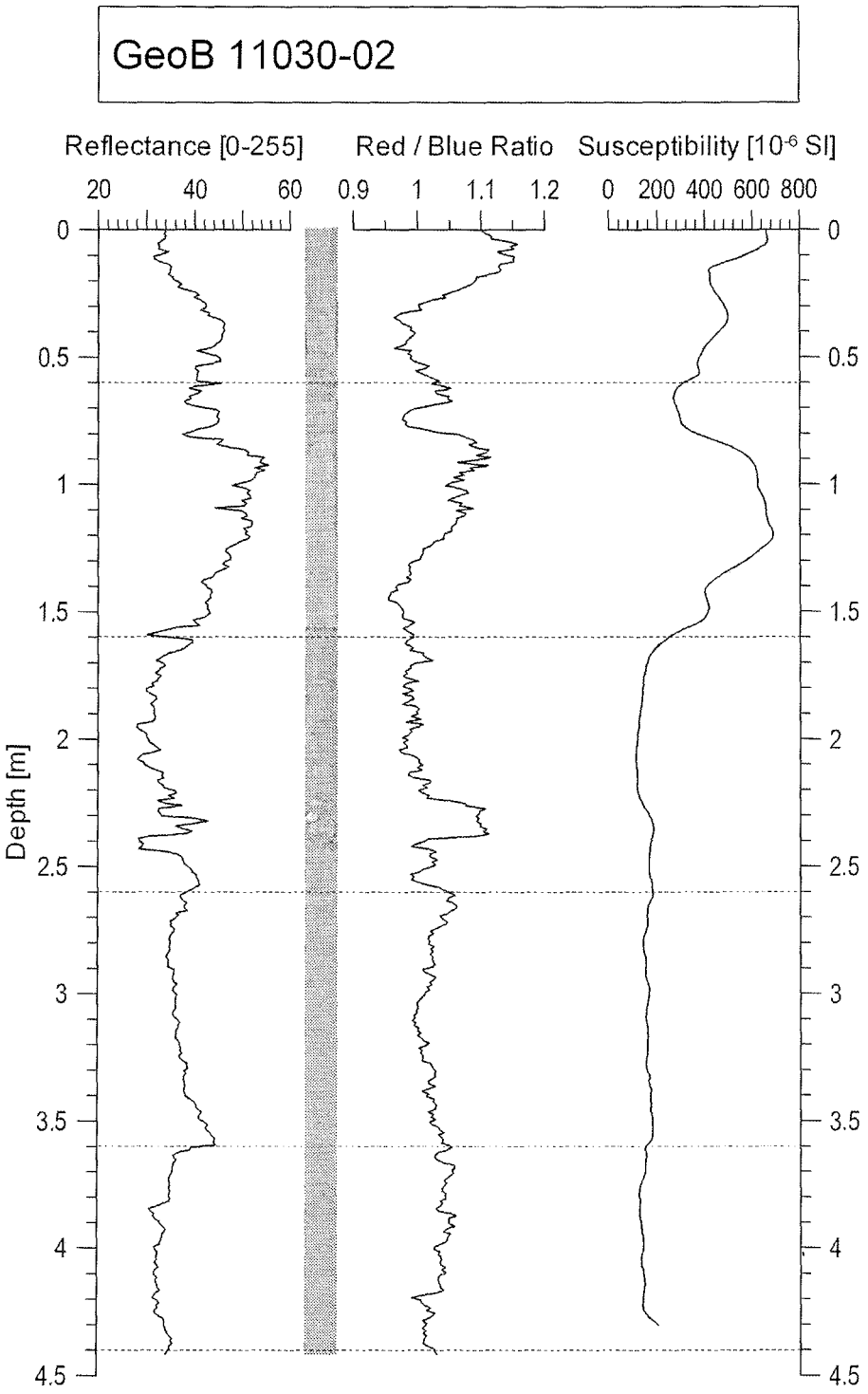
Grain size: cl: clay, si: silt, fs: fine sand, ms: medium sand, cs: coarse sand, gr gravel


GeoB 11029-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
20
40
60
0.8
1
1.2
0
500
1000
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

GeoB 11030-2$_{VC}$

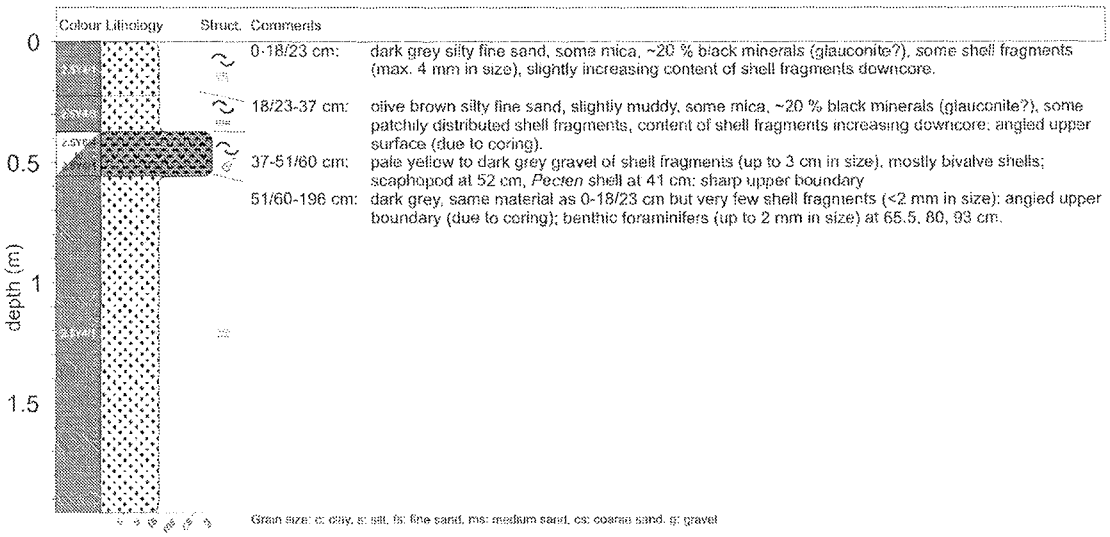
Date: 29.08.06 Pos: 41°58'00"N 8°59'24"W
Water depth: 94 m Core length: 460 cm




GeoB 11030-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
20
40
60
0.9
1
1.1
1.2
0
200
400
600
800
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

GeoB 11031-3$_{VC}$

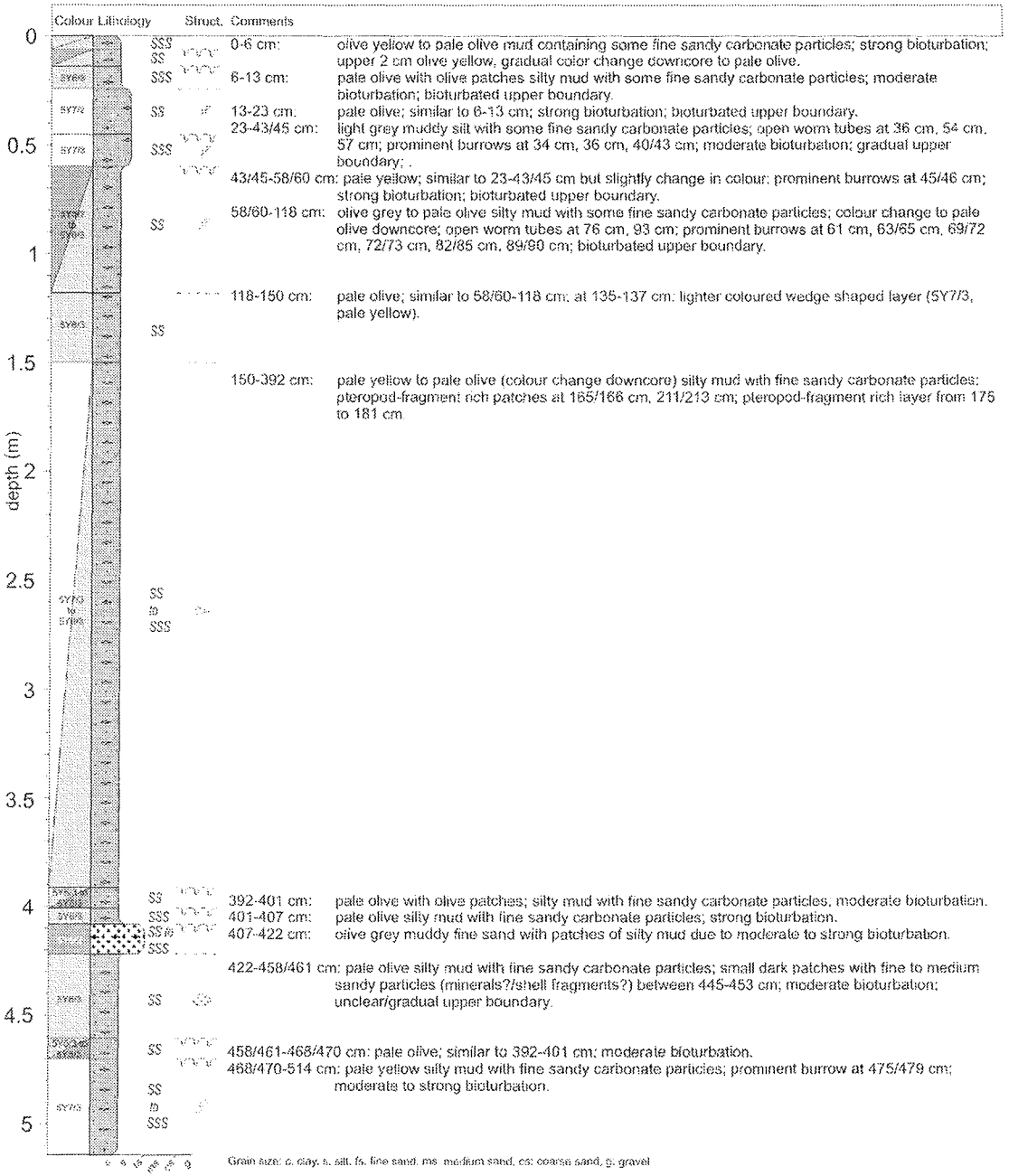
Date: 03.09.06 Pos: 42°05'04"N 9°09'25"W
Water depth: 148 m Core length: 196 cm



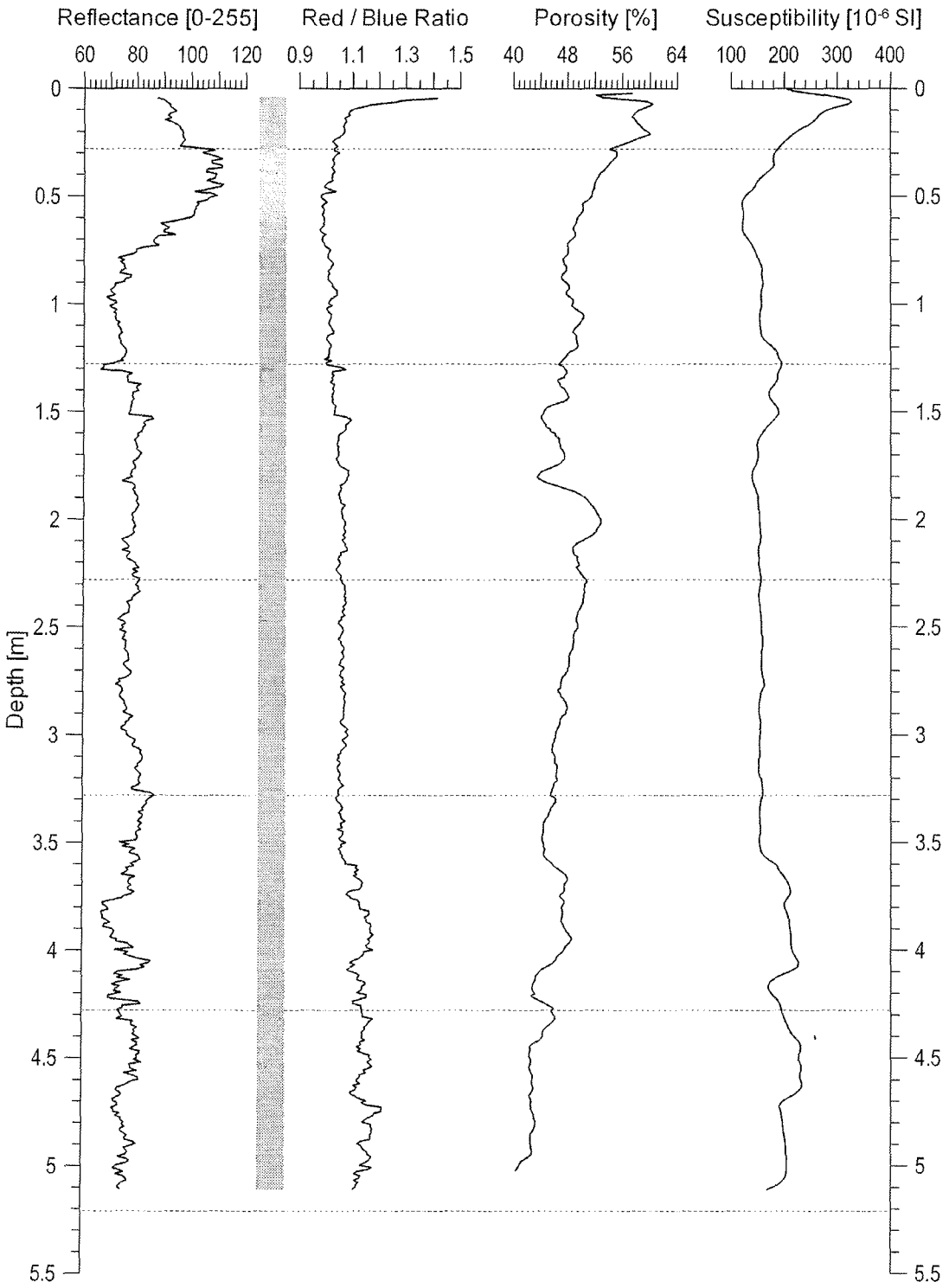
No physical properties data available

GeoB 11033-2$_{GC}$

Date: 31.08.06 Pos: 42°10'12"N 9°33'50"W
Water depth: 1874 m Core length: 514 cm

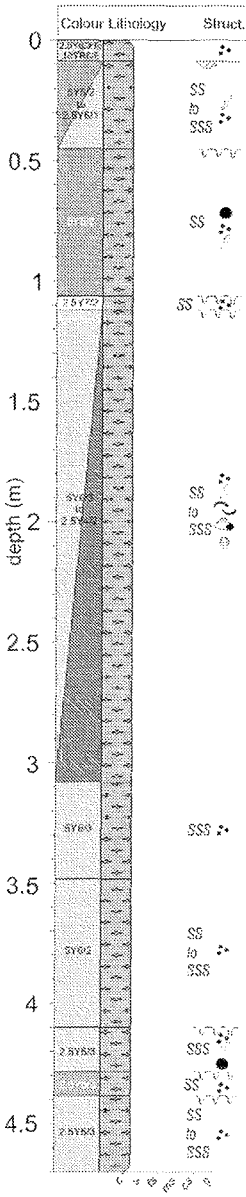


GeoB 11033-02



GeoB 11034-1 GC

Date: 31.08.06 Pos: 42°10'10"N 9°38'28"W
Water depth: 1983 m Core length: 470 cm



Comments

0-7/8 cm: light yellowish brown to brownish yellow mud with fine to medium sandy glauconite (?) and carbonate particles, brownish yellow layer-like structures.

7/8-42/45 cm: olive grey to grey, same as 0-7/8 cm; darker patches (olive grey) increasing from 33 cm upcore (intensifying of bioturbation?), single prominent burrows at 28/32, 43/45 cm, some of the burrows with reduced mud content; moderate to strong bioturbation; erosive upper boundary (?).

42/45-105/107 cm: olive grey, same material as 0-7/8 cm, some fine-sand sized black particles (glauconite?) at 56-42 cm, open worm tubes at 52, 56, 77, 90, 101 cm; single prominent burrows at 50, 52/53, 60/62, 62/64, 65/67 cm; organic spots at 69.5 cm and 71 cm; moderate bioturbation, upper boundary bioturbated.

105/107-110/111 cm: light grey, same material as above but lighter colour, moderate bioturbation, upper boundary bioturbated.

110/111-308 cm: pale olive to dark greyish brown, same material as 0-7/8 cm, single prominent burrows at 106, 112/114, 116/118, 124, 128, 159/161 cm; darker colour at 157-168 cm (2.5Y4/2); shell fragment-filled burrows at 188, 194-201 cm (mainly pteropods?); higher content of larger particles at 301-308 cm (silt to fine sand, single gastropod at 102 cm, small complete bivalve at 303.5 cm) - filled burrows?; upper boundary bioturbated.

(308-310 cm:) light greenish grey lense of overconsolidated clay, abundant medium to coarse sandy shells and glauconite (?) around the lense, some shell fragments (up to 7 mm in size); lense of silty fine sand with glauconite (?) content (~20 %).

310-348 cm: pale olive, similar to 110/111-308 cm; 310-312 cm: fine to medium sand-sized glauconite (?), strong bioturbation.

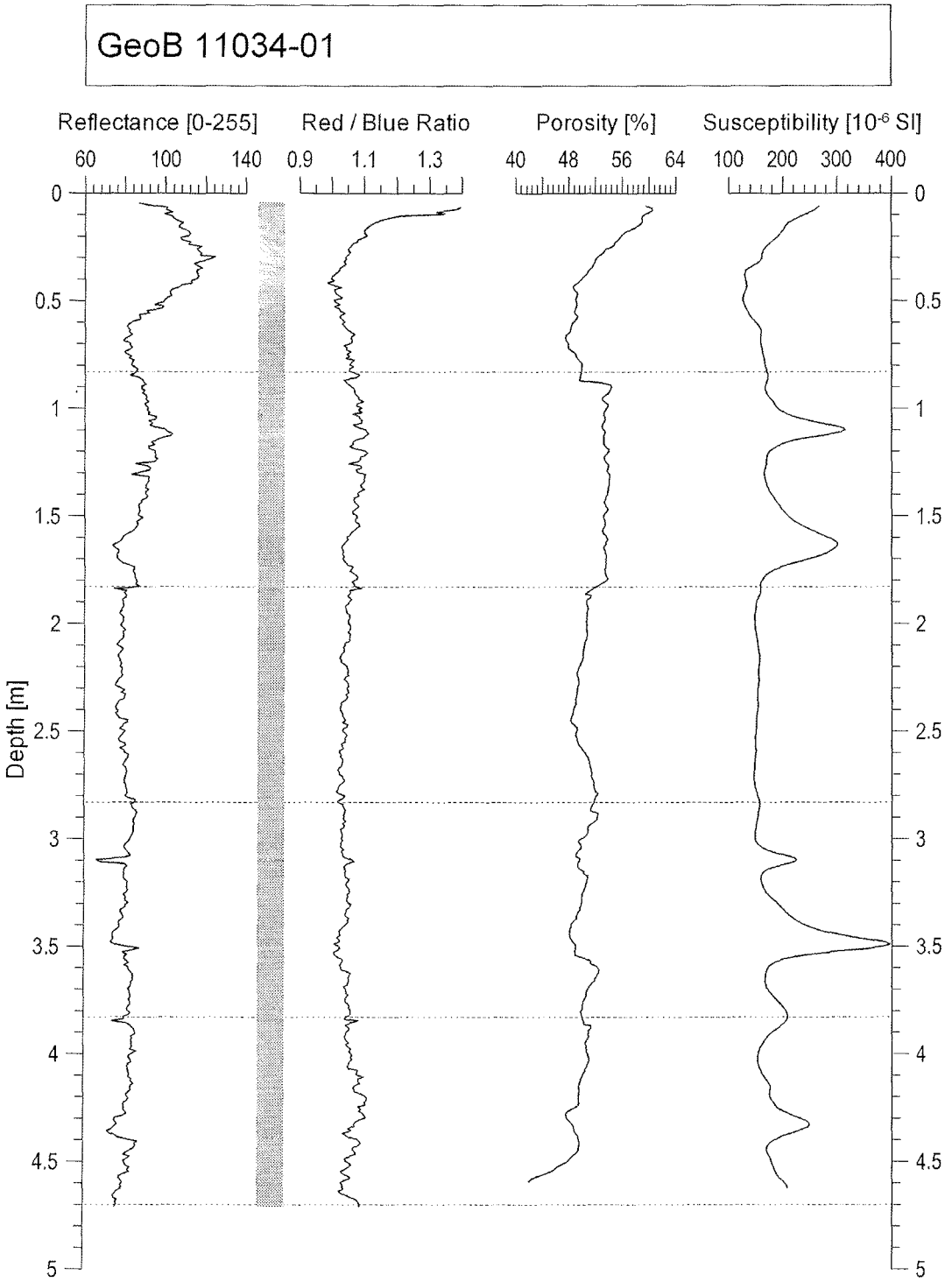
348-410 cm: light olive grey, same material as 310-348 cm; 348-350 cm: bleached (?) burrow (?); moderate to strong bioturbation.

410-427/428 cm: yellowish brown mud with fine to medium sand (carbonatic); open worm tube at 417 cm; small organic spot at 423 cm; strong bioturbation, upper boundary bioturbated.

427/428-438 cm: light olive brown, same material as 410-427/428 cm, moderate bioturbation, upper boundary bioturbated.

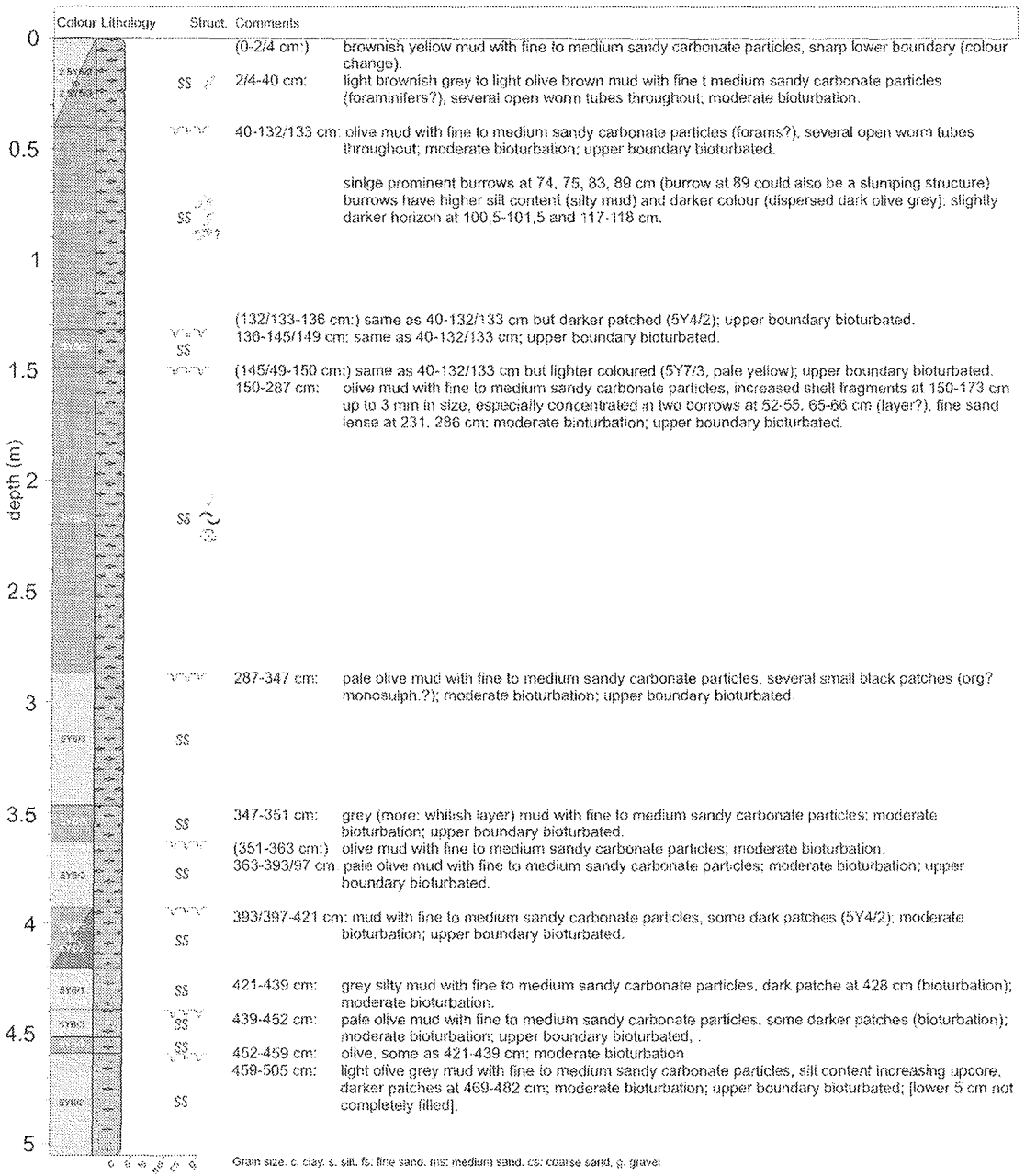
438-470 cm: light yellowish brown, same materia as 410-427/428 cm, moderate to strong bioturbation, upper boundary bioturbated.

Grain size: c: clay, si: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel


GeoB 11034-01
Reflectance [0-255]
60
100
140
Red / Blue Ratio
0.9
1.1
1.3
Porosity [%]
40
48
56
64
Susceptibility [10-6 SI]
100
200
300
400
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

GeoB 11035-1 GC

Date: 31.08.06 Pos: 42°10'18"N 9°39'28"W
Water depth: 2045 m Core length: 505 cm



(0-2/4 cm:) brownish yellow mud with fine to medium sandy carbonate particles, sharp lower boundary (colour change).

2/4-40 cm: light brownish grey to light olive brown mud with fine t medium sandy carbonate particles (foraminifers?), several open worm tubes throughout; moderate bioturbation.

40-132/133 cm: olive mud with fine to medium sandy carbonate particles (forams?), several open worm tubes throughout; moderate bioturbation; upper boundary bioturbated.

sinlge prominent burrows at 74, 75, 83, 89 cm (burrow at 89 could also be a slumping structure) burrows have higher silt content (silty mud) and darker colour (dispersed dark olive grey), slightly darker horizon at 100,5-101,5 and 117-118 cm.

(132/133-136 cm:) same as 40-132/133 cm but darker patched (5Y4/2); upper boundary bioturbated.

136-145/149 cm: same as 40-132/133 cm; upper boundary bioturbated.

(145/49-150 cm:) same as 40-132/133 cm but lighter coloured (5Y7/3, pale yellow); upper boundary bioturbated.

150-287 cm: olive mud with fine to medium sandy carbonate particles, increased shell fragments at 150-173 cm up to 3 mm in size, especially concentrated in two borrows at 52-55, 65-66 cm (layer?), fine sand lense at 231, 286 cm; moderate bioturbation; upper boundary bioturbated.

287-347 cm: pale olive mud with fine to medium sandy carbonate particles, several small black patches (org? monosulph.?); moderate bioturbation; upper boundary bioturbated.

347-351 cm: grey (more: whitish layer) mud with fine to medium sandy carbonate particles; moderate bioturbation; upper boundary bioturbated.

(351-363 cm:) olive mud with fine to medium sandy carbonate particles; moderate bioturbation.

363-393/97 cm pale olive mud with fine to medium sandy carbonate particles; moderate bioturbation; upper boundary bioturbated.

393/397-421 cm: mud with fine to medium sandy carbonate particles, some dark patches (5Y4/2); moderate bioturbation; upper boundary bioturbated.

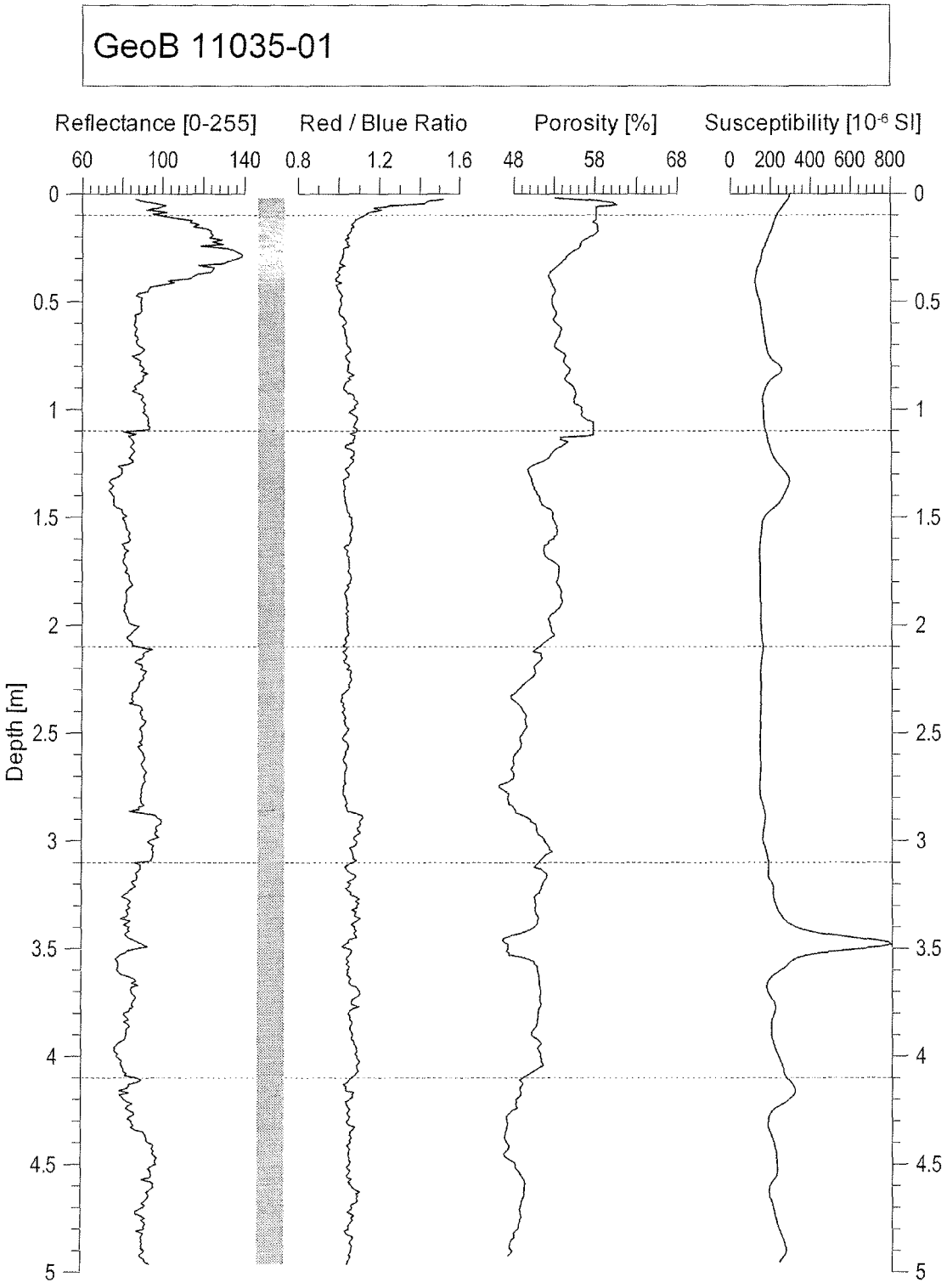
421-439 cm: grey silty mud with fine to medium sandy carbonate particles, dark patche at 428 cm (bioturbation); moderate bioturbation.

439-452 cm: pale olive mud with fine to medium sandy carbonate particles, some darker patches (bioturbation); moderate bioturbation; upper boundary bioturbated, .

452-459 cm: olive, some as 421-439 cm; moderate bioturbation.

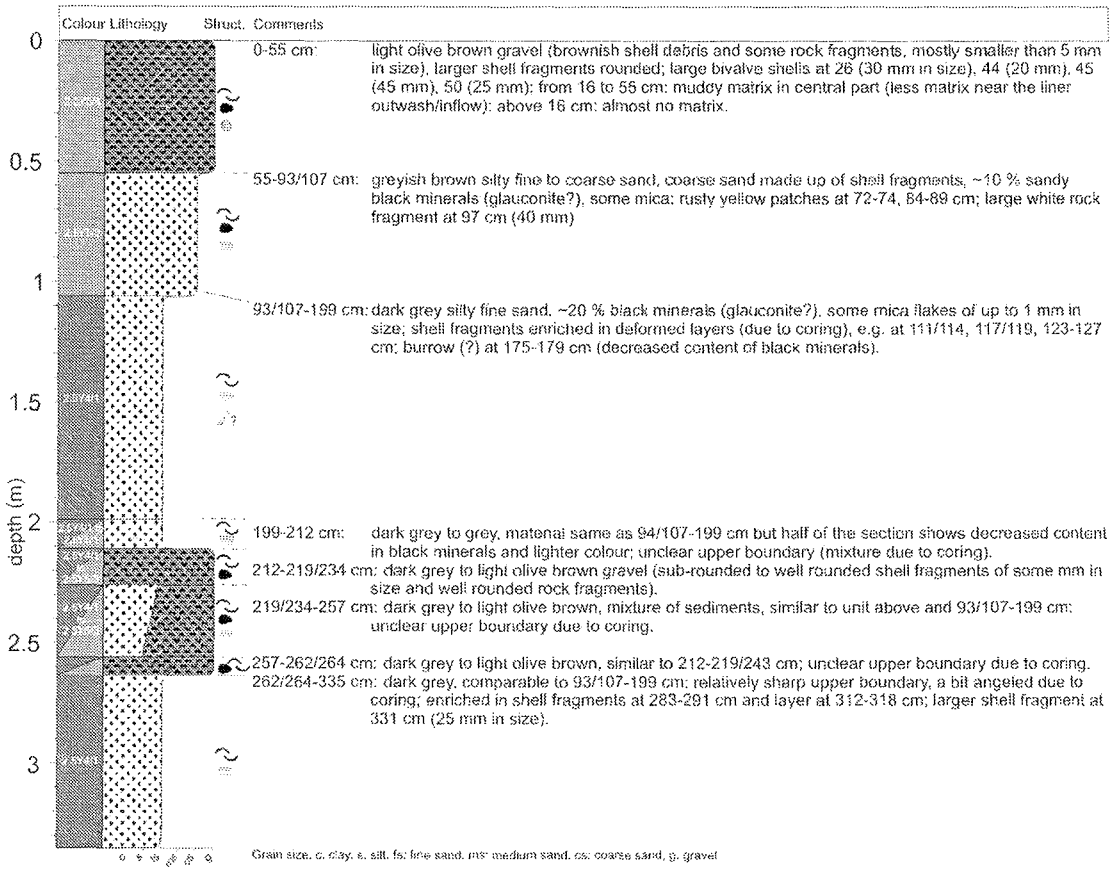
459-505 cm: light olive grey mud with fine to medium sandy carbonate particles, silt content increasing upcore, darker patches at 469-482 cm; moderate bioturbation; upper boundary bioturbated; [lower 5 cm not completely filled].

Grain size. c: clay, s: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel


GeoB 11035-01
Reflectance [0-255]
60
100
140
Red / Blue Ratio
0.8
1.2
1.6
Porosity [%]
48
58
68
Susceptibility [10-6 SI]
0
200
400
600
800
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

GeoB 11036-2$_{VC}$

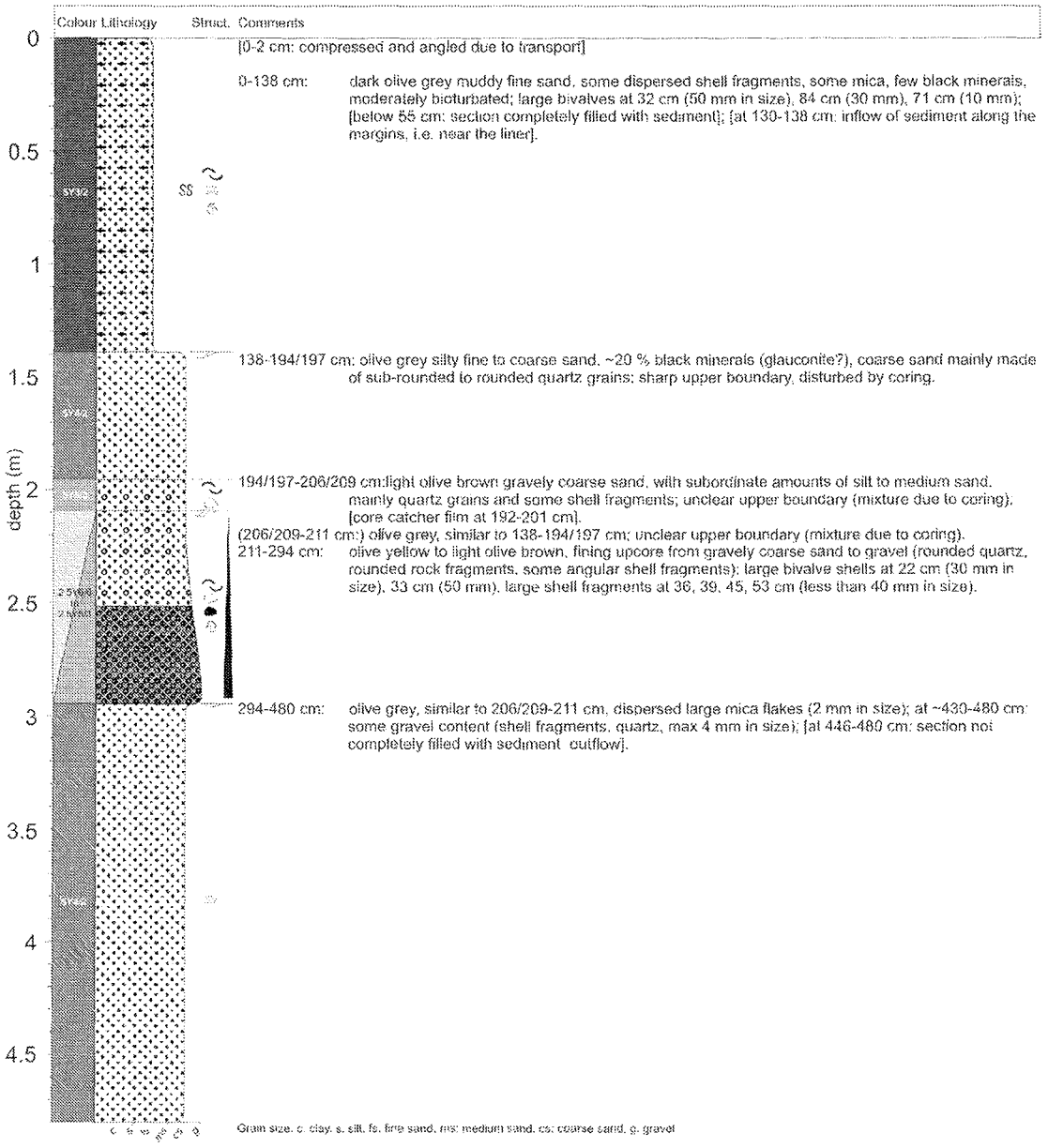
Date: 01.09.06 Pos: 41°48'03"N 9°11'15"W
Water depth: 125 m Core length: 335 cm



No physical properties data available

GeoB 11038-2$_{VC}$

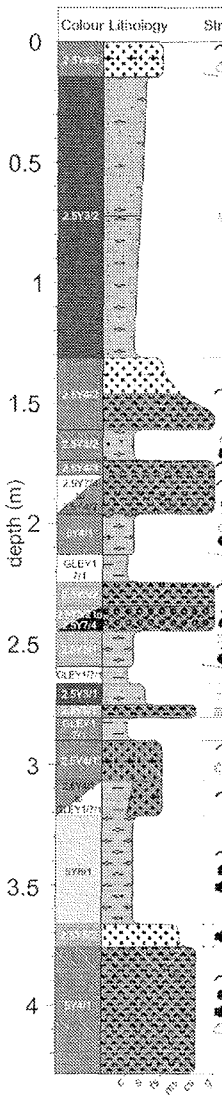
Date: 01.09.06 Pos: 41°38'03"N 8°58'27"W
Water depth: 78 m Core length: 488 cm



No physical properties data available

GeoB 11039-2$_{VC}$

Date: 01.09.06 Pos: 41°33'04"N 9°04'39"W
Water depth: 99 m Core length: 428 cm



0-13/15 cm: olive brown muddy fine sand, some *Turritella* dispersed, dispersed coarse sandy shell fragments.

13/15-132 cm: very dark greyish brown soft muddy silt to silty mud (slightly coarsening upcore), rich in mica, homogeneous; slightly angled upper boundary due to coring.

132-166 cm: dark greyish brown clayey fine sand with medium to coarse sandy shell fragments, fining upward (downcore change to coarse sand to gravel of shell fragments, with fine to medium sandy matrix); sharp upper boundary; at 148-153 cm: fine sandy silt layers, rich in mica, disturbed by coring.

166-174 cm: dark greyish brown fine sandy mud, 2 large well rounded rock fragments at 166 cm (80 mm in diameter) and 170 cm (50 mm), 1 large bivalve at 166 cm (30 mm in size, brownish); unclear upper boundary.

174-180 cm: olive brown coarse sand to gravel (shell fragments) with fine to medium sandy matrix (similar to bottom of section 132-162 cm), 4 large well rounded rock fragments (up to 65 mm in size) at 180 cm (bottom of section); unclear upper boundary.

180-196 cm: pale yellow to dark greyish brown gravel (angular to sub-angular shell fragments and some well rounded yellowish rock fragments, up to 15 mm in size); upper boundary transitional (mixing?).

196-211 cm: dark grey slightly fine sandy mud, rich in mica, tiny black spots (monosulphides?); transitional upper boundary (mixing?, coring?, bioturbation?), coarsening upward.

(211-213 cm:) dark grey coarse sandy shell gravel

(213-215 cm:) light greenish grey pare stiff clay

(215-216/217 cm:) dark grey pure fine sand, some mica; sharp upper boundary; inflow of material from 223/225-234 cm?

216/217-223/225 cm: light greenish grey, similar to 113-115 cm, some dispersed black spots (organics?, monosulfphides); sharp but angled upper boundary.

223/225-234 cm: olive grey coarse sand to gravel (shell fragments), comparable to 180-196 cm, lens of muddy fine sand at 131-134 cm.

234-244 cm: olive grey to pale yellow gravel (shell fragments, well rounded rock fragments up to 20 mm), comparable to 180-196 cm, lens of muddy fine sand at 137-141 cm.

244-258/260 cm: grey, comparable to 196-211 cm, coarse fragments patchily distributed (mixing?); transitional upper boundary (mixing?, coring?, bioturbation?).

258/260-264/267 cm: light greenish grey, comparable to 213-215 cm, disturbed by coring; sharp but angled by coring.

(264/267-268 cm:) grey silty fine sand with abundant medium to coarse sandy shell fragments, <10 % black minerals (glauconite?), some mica; sharp boundary but angled by coring.

268-275 cm: very dark grey muddy silt, lighter in colour at the bottom, rich in mica; sharp upper boundary.

275-281 cm: very dark grey medium to coarse sandy shell fragments with silty fine sandy matrix, some mica, comparable to 264/267-268 cm but much more medium to coarse sandy shell fragments; sharp upper boundary.

281-290/291 cm: light greenish grey, similar to 213-215 cm, lower 1-2 cm darker in colour; sharp upper boundary.

290/291-307 cm: dark grey muddy fine sand with abundant medium to coarse snady shell fragments, comparable to 264/267-268 but contains mud, large strangely stretched formerly layered bed of pure stiff clay (similar to 213-215 cm) coring influence; sharp upper boundary.

307-322 cm: dark grey to light greenish grey, mixture of muddy fine sand with abundant medium to coarse sandy shell fragments and pure clay; unclear upper boundary.

322-367 cm: grey mud containing coarse sandy particles (shell fragments), large concretions of silty material at 326 cm (10 mm in diameter), 335 cm (90 mm), 348 cm (10 mm), 365 cm (20 mm) not yet fully lithified, large well-rounded rock fragments in lower half of section at 347, 344, 357, 358, 362 cm (10-25 mm in size) "swimming" in muddy matrix; unclear upper boundary.

367-376 cm: greyish brown very large concretion of silty material, partly broken into pieces, not yet fully lithified; unclear upper boundary.

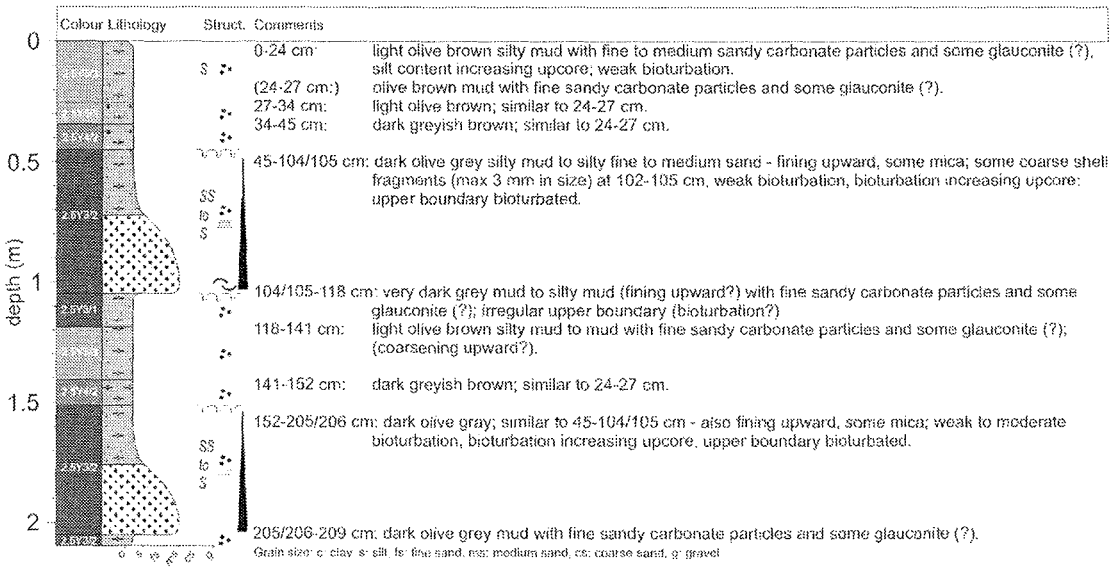
376-428 cm: dark grey medium to coarse sandy shell fragments in muddy silt matrix (comparable to 275-281 cm but finer matrix); large concretions (sandstone rock fragments?, sub-angular) at 388 cm (20 mm in diameter), 401 cm (75 mm), 411 cm (20 mm), 419 cm (15 mm); large well-rounded rock fragments at 408, 409, 413 cm (<30 mm in size), large rounded gastropod at 469 cm (10 mm in size), at the bottom mixture of pure clay and overconsolidated(?) silty fine sand with medium to coarse sandy shell fragments; unclear upper boundary.

Grain size: c: clay, s: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel

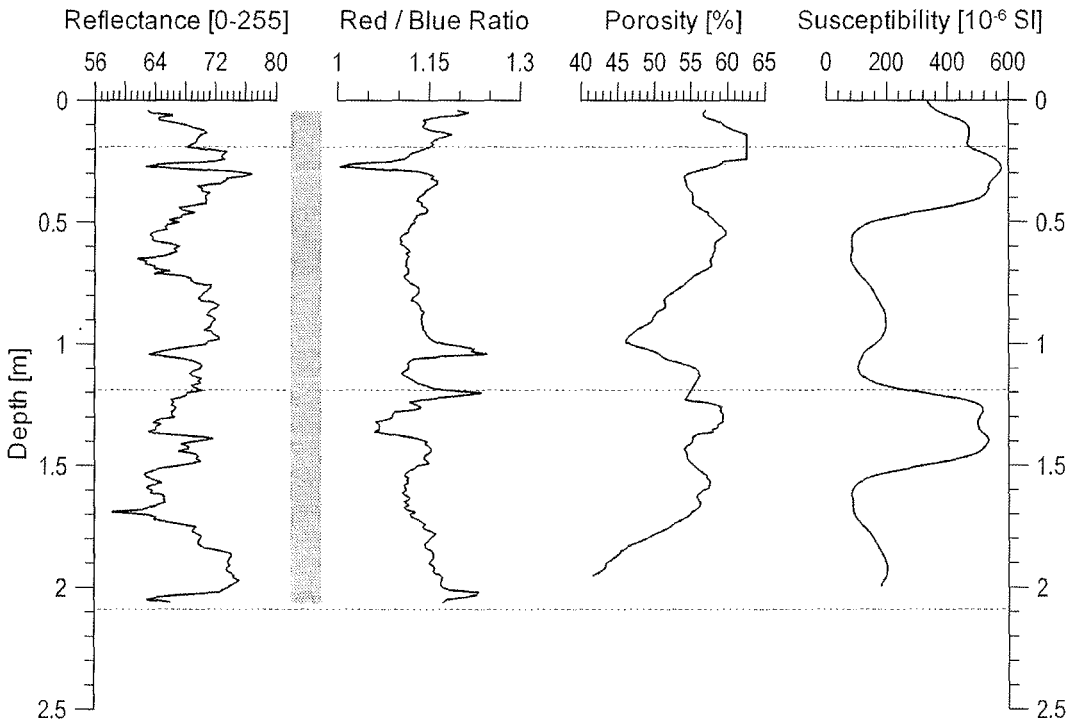
No physical properties data available

GeoB 11039-3$_{VC}$

Date: 04.09.06 Pos: 41°33'06"N 9°04'38"W
Water depth: 99 m Core length: 209 cm

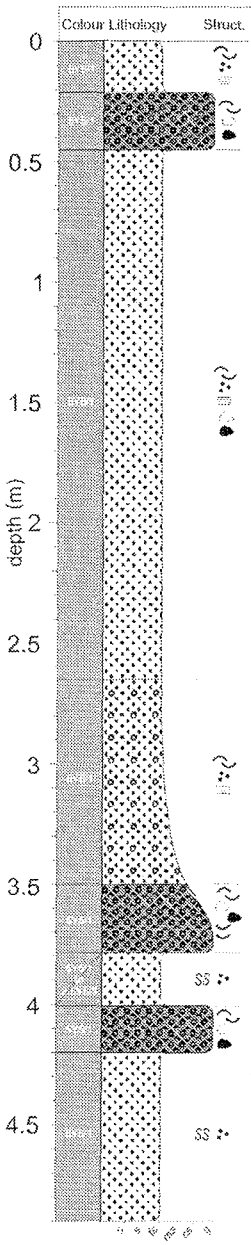


GeoB 11039-03



GeoB 11040-2$_{VC}$

Date: 01.09.06 Pos: 41°38'04"N 9°04'02"W
Water depth: 98 m Core length: 490 cm



Comments

0-19/22 cm: grey silty fine sand, ~20 % glauconite (?), some mica and few medium to coarse-sand sized shell fragments.

19/22-44 cm: grey gravel layer made of large shells (up to 40 mm in size, white/grey/brown, mainly concave upward), siliceous grains (coarse sand to gravel, max. 40 mm, edges rounded, transparent, yellowish to brown), and small grey shell fragments (max. 5 mm in size); matrix shows same material as 0-44 cm - inflow?; 40-44 cm: no matrix - only shells and siliceous gravel and small shell fragments; 2 rock fragments (10-15 mm in size, one white, the other brown) at 19.5 cm and 21 cm.

44-265 cm: grey, same as 0-44 cm; sharp upper boundary, gradually upcore-decreasing gravel content (above 265 cm gravelly fine sand, above 350 cm major content pure gravel).

265-350 cm: grey gravelly silty fine sand, gradual boundary; gravel: shell fragments, quartz grains, rock fragments; white, yellowish, brown, reddish.

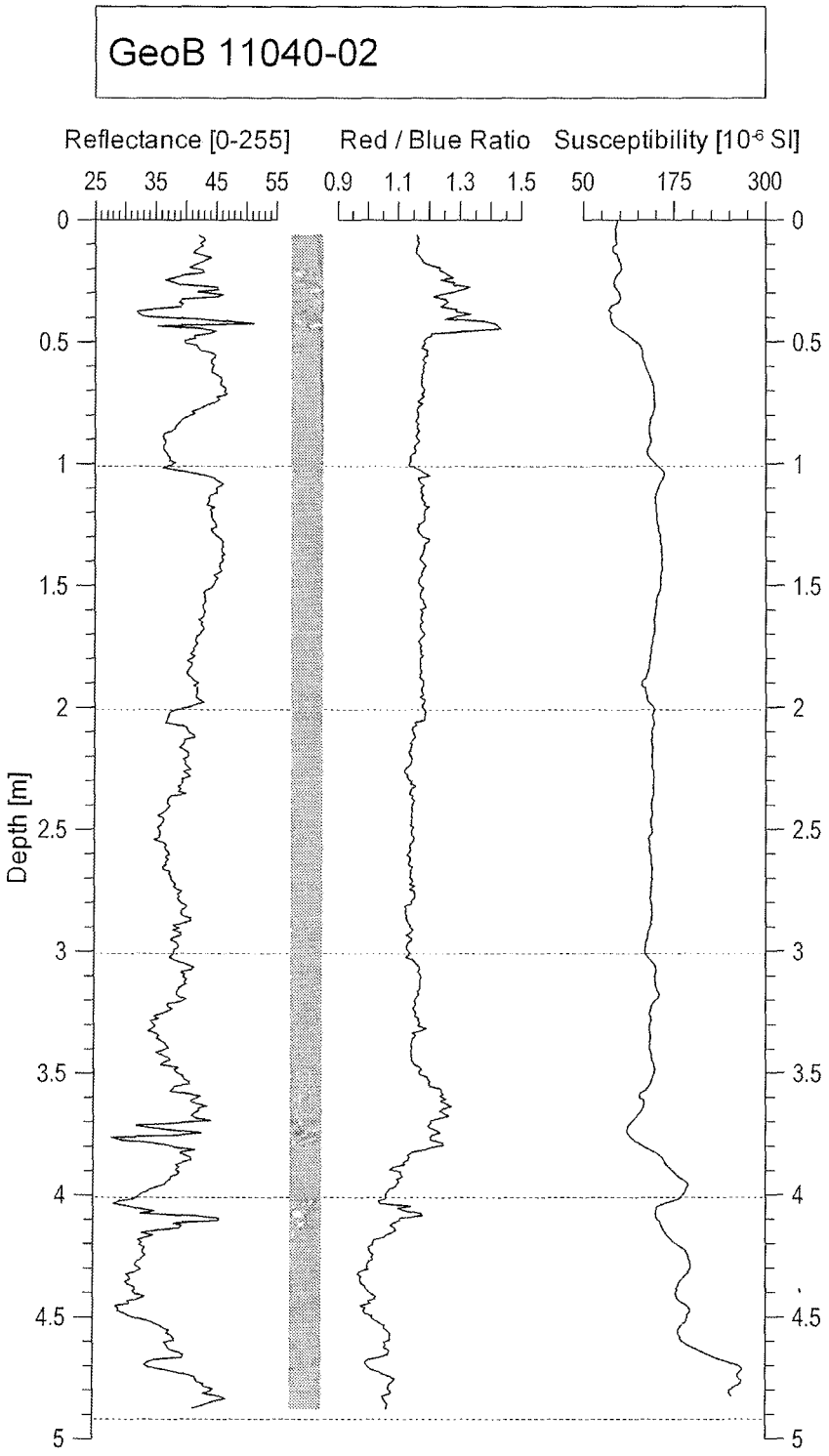
350-375/378 cm: grey gravel; large shells at 369-375/378 cm, concave upward, white to yellowish, brown, reddish, gradual upper boundary; gravel content: shell fragments (max. 15 mm), quartz grains and rock fragments (max. 5 mm).

375/378-401 cm: grey to light olive brown silty fine sand, 20 % glauconite (?), abundant bioturbation lenses depleted in glauconite; sharp upper boundary (due to coring).

401/420 cm: gravel (shells, quartz grains, rock fragments, shell fragments); strange pocket!; directly starting at top of section, but section above does not show gravel at ist base.

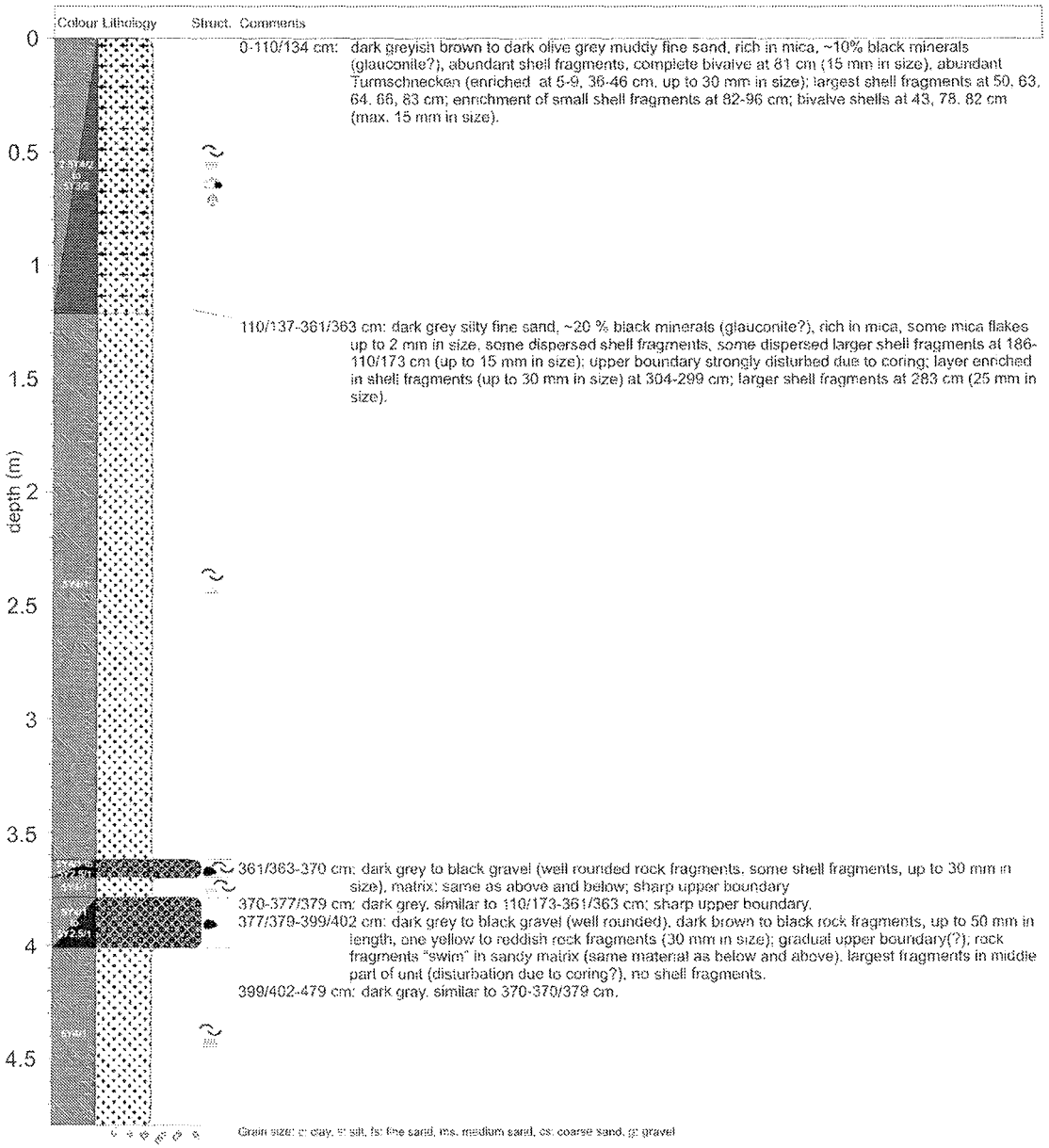
401/420-490 cm: similar to 374/380-401 cm, lenses with upcore-increasing glauconite (?) content.

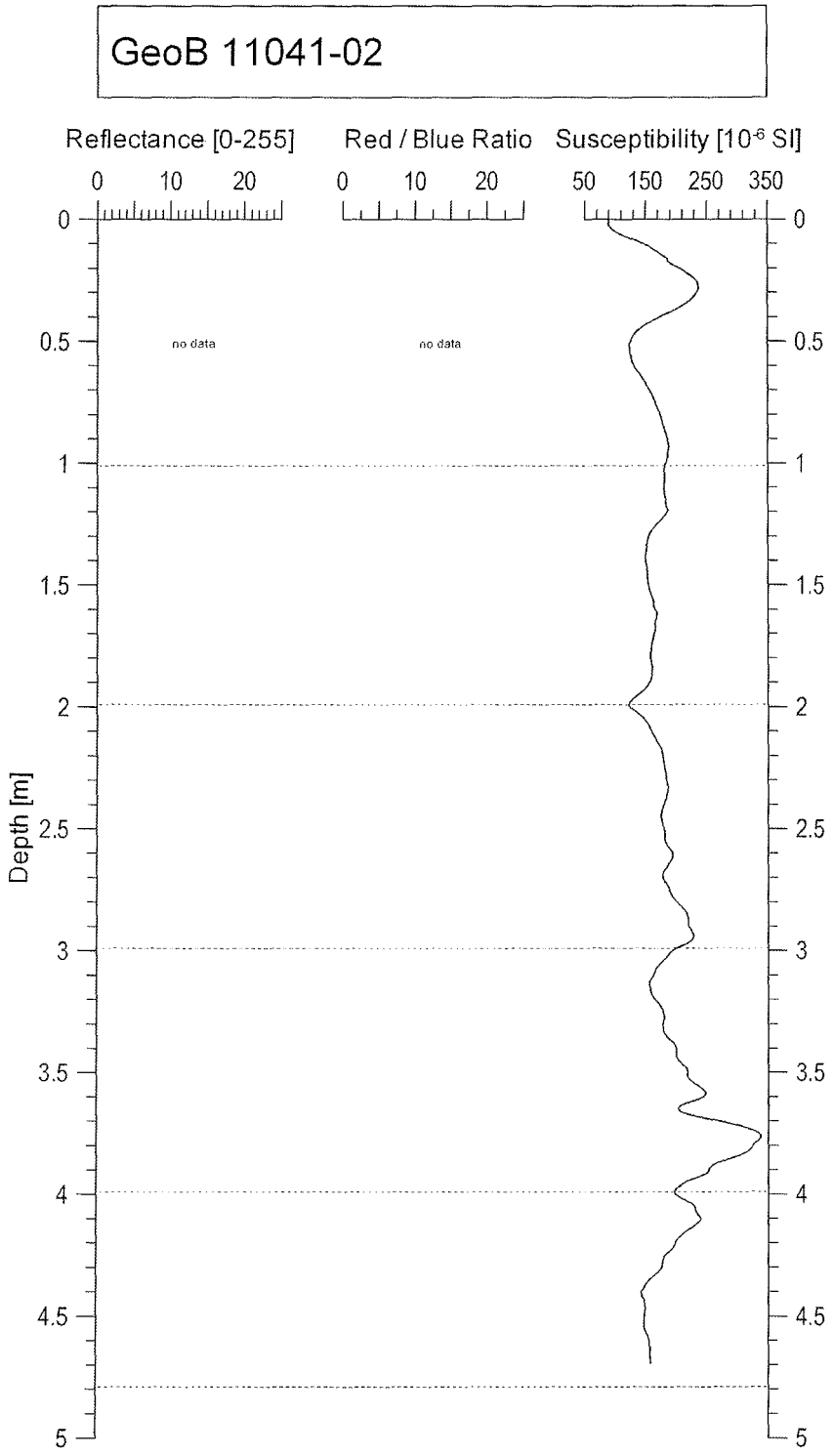
Grain size: c: clay, si: silt, fs: fine sand, ms: medium sand, cs: coarse sand, g: gravel


GeoB 11040-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
25 35 45 55
0.9 1.1 1.3 1.5
50 175 300
Depth [m]
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5

GeoB 11041-2$_{VC}$

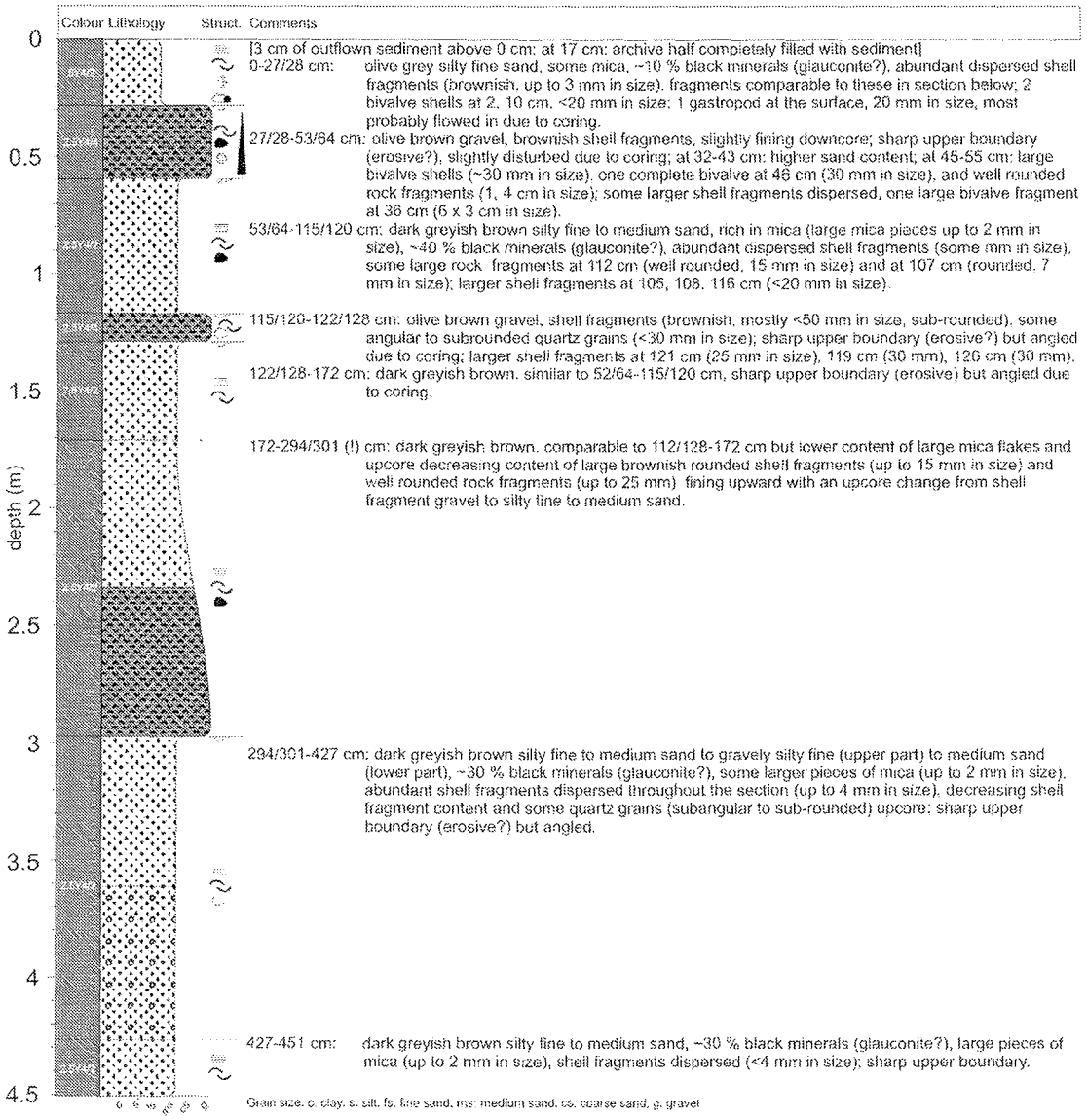
Date: 02.09.06 Pos: 41°48'05"N 9°00'37"W
Water depth: 93 m Core length: 479 cm

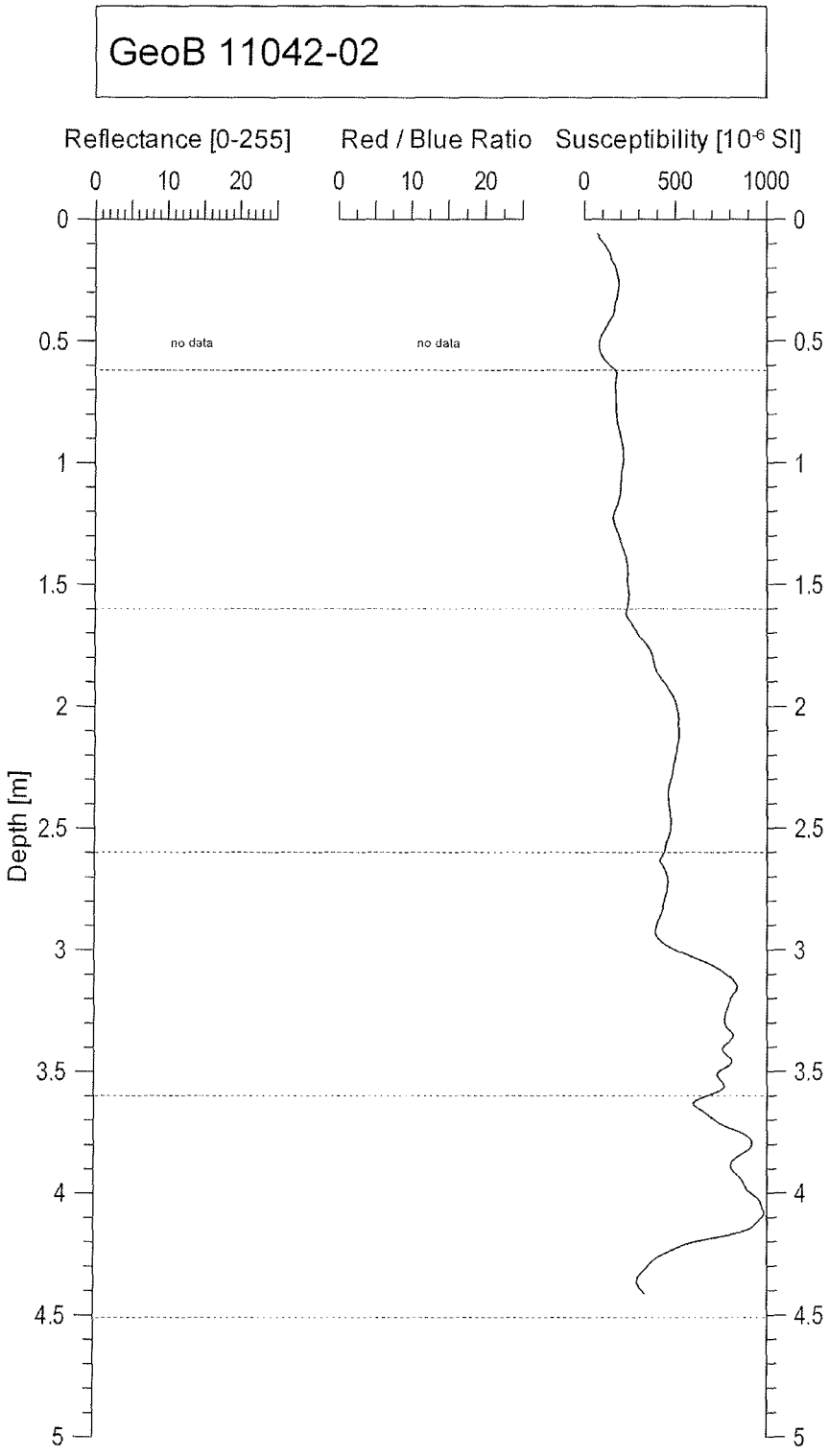



GeoB 11041-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
0 10 20
0 10 20
50 150 250 350
no data
no data
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

GeoB 11042-2$_{VC}$

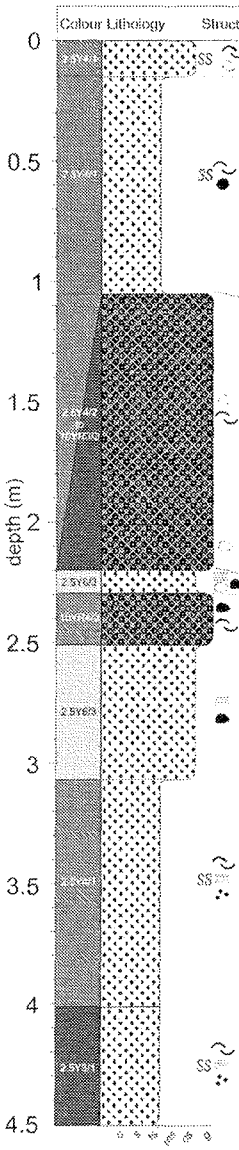
Date: 02.09.06 Pos: 41°43'04"N 9°01'07"W
Water depth: 96 m Core length: 451 cm




GeoB 11042-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
0
10
20
0
10
20
0
500
1000
no data
no data
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

GeoB 11043-2$_{VC}$

Date: 02.09.06 Pos: 41°33'06"N 9°00'03"W
Water depth: 84 m Core length: 451 cm



0-14 cm: dark grey fine-sandy middle to coarse sand with quartz gravel and shell debris, loose, moderately bioturbated.

14-100/109 cm: dark grey silty very fine sand, rich in mica, some darker spots (organics?), coarse-sandy patches due to bioturbation, tiny shell fragment throughout, pure quartz silt/fine sand spots below 85 cm (also lighter), lower boundary sharp and distorted due to coring, moderately bioturbated; 100-109 cm: lighter pure finest sand with slight clay content in the lower part (100-80 cm).

100/109-219/225 cm: dark grey massive gravel layer with coarse sand, gravel up to 6 mm in size, poorly sorted, grains well rounded but also some sharp-angeled shell fragments, constructed of 4 layers which are internally homogeneous:

1) higher dark greyish brown coarse-sand content ("matrix") at 168-100/109 cm.
2) dark brown almost pure gravel, single largest pieces 20 mm, also shells (some fresh, some alterated) at 196/197-168 cm.
3) dark greyish brown coarse-sandy gravel at 202-196/197 cm, similar to 1) 186-100/109 cm.
4) dark yellowish brown slightly sandy gravel at 219/225-202 cm, similar to 2) 196/197-168 cm, fewer larger pieces moderately rounded and 20 mm in size.

[general valid for the whole gravel bed: components are of various rock origin and fresh & altered shell fragments, poorly sorted and no internal structures; borders between the 4 subunits always sharp].

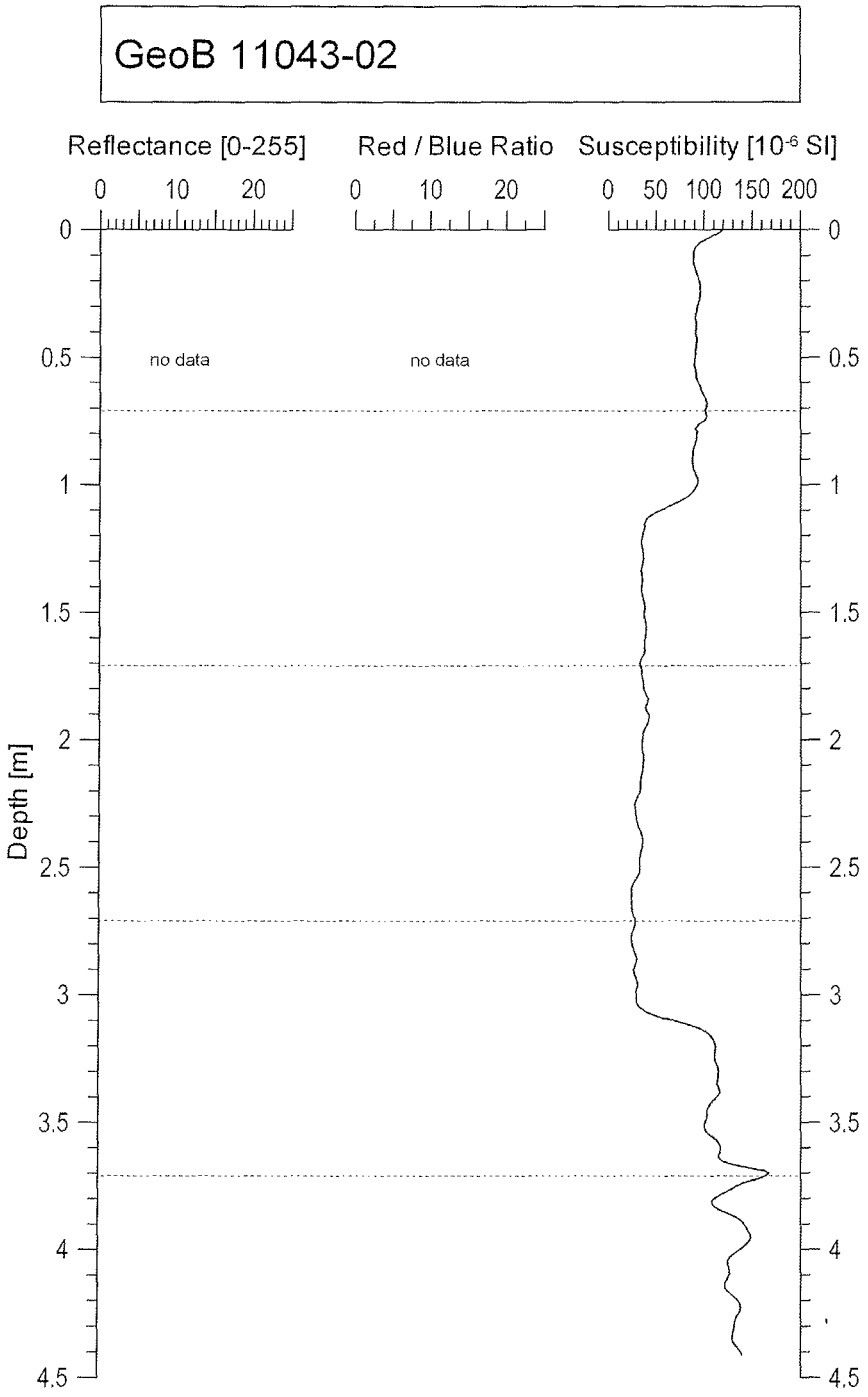
219/225-229 cm: light yellowish brown medium-sandy coarse sand layer, mainly quartz and rock particles, few larger-sized (2 mm) mica flakes; both boundaries sharp, the upper distorted due to coring.

229-252 cm: brown sandy gravel, single larger pieces (well-rounded rock fragments, dark undestroyed shells), poorly sorted, similar to 4) 219/225-202 cm.

252-307 cm: light yellowish brown "bleached" slightly gravely medium-sandy coarse sand, single larger gravel pieces (well rounded, abundant mica flakes (up to 4 mm in size), not well sorted and relatively homogeneous, grains of various rock origin.

307-402 cm: dark grey homogeneous medium-sandy fine sand, rich in mica, mm-sized shell debris throughout, black-mineral content high, frequent lighter spots of pure fine sand (boring tubes, bioturbation).

402-451 cm: very dark grey, similar as above (307-402 cm), slightly darker, very slight mud content (a bit sticky), very homogeneous, dito rich in mica.


GeoB 11043-02
Reflectance [0-255]
Red / Blue Ratio
Susceptibility [10-6 SI]
0 10 20
0 10 20
0 50 100 150 200
no data
no data
Depth [m]
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

4.3.4 Sedimentology: shipboard results

4.3.4.1 The sediment cores

The cruise P-342 has clearly succeeded its aims from a sedimentological point of view. Since it is essential to take a large number of sediment cores in shelf settings due to the common local facies and age variability (due to erosion and mixing effects), the dense grid of cores received will clearly enable us to resolve in necessary detail the sediment distribution pattern and the evolutionary history of the shelf with regard to sediment separation processes. The 43 sediment cores with a total length of 155 m recovery are placed along five east-west profiles and in three additional provinces to construct a sort of broad-envelope north-south transect. This strategy was the attempt to follow the suggested main routes of sediment transport. The distribution of ground-truthing cores, therefore, provides the material base to trace the sedimentary inventory in detail, both through time and space. It can be assumed that the sediment records cover a time interval of the past 15 to 20 thousand years, with main focus on the past 10 thousand years. We expect to have the tool now in our hands, to investigate the migration behavior of different sediment components in relation to their grain size as well as independent of this parameter.

The Galician-northern Portuguese shelf is, in terms of sedimentary provinces, is famous for its inner to mid-shelf Late Holocene mud belt (two "mud patches") which is elongated from its sediment feeders in the south to the northwestern edge of the Iberian Peninsula. Its seaward margin is straight, lobate or patchily dissected, its landward margin often characterized by local sediment pockets trapped by the rocky seabed. However on the seaward side of this well-known mud belt, several either very local or sheet-like sediment covers are preserved as well not described yet in the literature. The cores taken from these locations will enable us to understand whether the sediment dynamics in the modern mud belt and these outer-shelf depocenters are linked with each other or if there is a temporal gap due to certain changes.
The outer shelf is, besides the local sediment sheets, more or less bare of modern sedimentation. An intensive glauconite formation was discovered in six cores with clear indication that this processes is still ongoing. Age control will lead to an understanding how long the siliciclastic and carbonate materials are stored here and how much of younger material is contributed to this place. Around the shelf break, deposits are always coarse-grained. This fact leads to the assumption that the finer components cross the shelf completely towards the open ocean.

4.3.4.2 Types of sedimentary facies

The NW Iberian continental shelf is a typical example of a storm-dominated environment. This campaign made possible for the first time to receive sub-bottom material from all parts of the shelf, in particular from the wide sand-dominated portions. Such a high variability of sedimentary facies from this shallow-water area was completely undiscovered and unexpected yet. The following types of facies can be distinguished (as a first tentative determination from shoreface to shelf break):

1. A modern fluffy layer with different sorts of epibenthic organisms on most places on the shelf as frequently seen in the Giant Box cores
2. Innermost shelf gravels and boulders probably of paleo-coastal origin;
3. Inner to mid-shelf modern mud belt with gradual coarsening towards its edges and a potentially time-transgressive south-north extend;
4. A number of isolated sandy and gravelly shell beds with high matrix content in different stratigraphic positions which represent probably the local or laterally extended condensation products of storm events (tempestites);
5. Thick pure gravel shell horizons with large shells and well-rounded boulders assumingly representing former, drowned beach lines, and being considered as time-transgressive;
6. Over-consolidated paleosols with preserved internal structures of presumably Late Pleistocene in age;
7. Transgressive accumulation horizons on top of these old soils and on the massive shell (coastline?) beds;
8. Pure clay intercalations as of lacustrine origin (as a first careful estimate);
9. Outer shelf fine sand sheets and patches which probably act as subsequent depocenters of the finer material which has been reworked from or bypassed across the inner mud belt center;
10. Centers of massive and currently ongoing authigenic glauconite formation on the outer shelf where younger or modern sedimentation does obviously not occur at elevated rates;
11. The seaward side of the shelf break with coarse sands, at least indicating that the uppermost continental slope does not act as sink for the fine material;
12. The normal marine basin sedimentation at the lower continental slope as reference cores and as the proposed final sink of suspended materials which, at least at first glance, do not seem to show enhanced sedimentation rates.

4.3.4.3 Cores from the continental margin off Galicia

Four cores have been taken from the lower continental slope for two reasons. First, we wanted to collect a stratigraphic reference core which has received a certain amount of shelf-derived sediment. The areas of these core locations have been suspected for being the final sink place for fine material. Using the XRF Scanner at RCOM on Core GeoB 11035, the after-cruise measurement of the Ca content which should be considered to mainly reflect the carbonate content seems to evidence higher sedimentations rate during early and high glacial times but at relatively low sedimentation rates of some 10 cm/kyr. The second reason was the request of colleagues in Bremen for a deep-sea core to work on paleoceanographic questions.

It is not clear yet, whether Cores GeoB 11024 and 11033 contain continuous sedimentary records from the lower continental margin or whether some gravity-driven transport could have contributed to the sequence. According to the seismic profiling, mass wasting deposits could be expected here to shaping the seafloor. Such a process is not obvious from the two cores – also not to exclude it – but some sandy layers might be of turbidite origin. Also, Heinrich layers seem not to occur in these records.

4.4 Physical Properties

(Th. Frederichs)

Most of the sediment series recovered during POSEIDON Cruise P-342 by vibro and gravity coring were subject to routine geophysical shipboard measurements (Table 4.4.2.1). These were performed on closed full cores or on open half cores and comprised three basic parameters:

- Magnetic volume susceptibility κ,
- Electrical resistivity R_s as a measure of porosity and density,
- Spectral light reflectance

These properties are closely related to sediment lithology and provide high-resolution core logs with a standard spacing of 1 cm for electrical resistivity and magnetic susceptibility and 0.01 cm for light reflectance. They were measured with a customized GEOTEK Multi-Sensor Core Logger (MSCL) utilizing a stepper motor to convey core segments along a track and through a series of sensors. Positions and lengths are automatically detected. The separate logging measurements are controlled and rapidly collated by the systems computer terminal.

4.4.1 Physical Background and Experimental Techniques

Magnetic Susceptibility

The magnetic volume susceptibility κ is defined by the equations

$$B = \mu_0 \cdot \mu_r \cdot H = \mu_0 \cdot (1 + \kappa) \cdot H = \mu_0 \cdot H + \mu_0 \cdot \kappa \cdot H = B_0 + M$$

with magnetic induction B, absolute and relative permeabilities μ_0 and μ_r, magnetizing field H, magnetic volume susceptibility κ and volume magnetization M. As can be seen from the third term, κ is a dimensionless physical quantity. It records the amount to which a material is magnetized by an external magnetic field.

For marine sediments the magnetic susceptibility may vary from an absolute minimum value of $-15 \cdot 10^{-6}$ (diamagnetic minerals such as pure carbonate or silicate) to a maximum of some $10.000 \cdot 10^{-6}$ for basaltic debris rich in (titano-) magnetite. In most cases κ is primarily determined by the concentration of ferrimagnetic minerals, while paramagnetic matrix components such as clays are of minor importance. Enhanced susceptibilities indicate higher concentrations of lithogenic or authigenic components. This relation may serve for correlating sedimentary sequences deposited under similar global or regional conditions.

The core logger is mounted with a commercial BARTINGTON M.S.2 susceptibility meter with a 140 mm loop sensor. Due to the sensor's size, its sensitivity extends over a core interval of about 10 cm. Consequently, sharp susceptibility changes in the sediment column will appear smoothed in the κ core log and thin layers such as ashes cannot appropriately be resolved. In order to make an accurate end correction at the base of each segment and to assess the drift of the susceptibility meter, a spacer cylinder of 29.5 cm length was placed between each segment during the measurement procedure. The measurements taken at the centre of the spacer was used to assess and compensate the instrument drift. During post-processing all data related to void sections were removed to provide a continuous composite core log.

Electrical Resistivity and Porosity

The electrical sediment resistivity R_s was determined using an inductive non-contact sensor. The system applies high frequency magnetic fields by a transmitter coil inducing electrical eddy currents in the sediment which are proportional to conductivity. Their secondary field is recorded and yields raw and calibrated values for conductivity and resistivity. Porosity was calculated according to the empirical Archie's equation

$$R_s/R_w = k \cdot \phi^{-m}$$

where the ratio of sediment resistivity R_s and pore water resistivity R_w can be approximated by a power function of porosity ϕ. Following a recommendation by BOYCE (1968), suitable for sea water saturated clay-rich sediments, values of 1.30 and 1.45 were used for the constants k and m, respectively. The calculated porosity ϕ is subsequently converted to wet bulk density ρ_{wet} using the equation (BOYCE, 1976)

$$\rho_{wet} = \phi \cdot \rho_f + (1 - \phi) \cdot \rho_m$$

with a pore water density ρ_f of 1030 kg/m^3 and a matrix density ρ_m of 2670 kg/m^3. For a uniform treatment of all cores, these empirical coefficients were not adapted to individual sediment lithologies. Yet, relative porosity and density changes should be well documented.
The resistivity sensor averages over approximately 12 cm core length. A platinum thermometer inserted into a segment continuously measures sediment temperature for temperature compensation. Absolute sensor calibrations using a series of saline standards are performed prior to the measurement of each core. For subsequent drift and segment end correction, 29.5 cm long insulating spacers were placed between segments during logging. Thus, the characteristic decay of the eddy currents nearby the end-caps was separately recorded for each segment and corrected on basis of a model curve. This method provides a continuous composite record, however the first 2-3 data points from each intersection were discarded due to some overshooting.
Electrical resistivity data are not presented here due its poor quality. Most of the cores suffered from pore water draining after recovering and splitting of the cores due to the generally coarse grain size of the sediments. Since the electrical resistivity of sediment cores is dominated by pore water resistivity, the loss of pore water leads to erroneous results in electrical resistivity determination. Results of gravity cores are shown where appropriate.

Light Reflectance

Spectral light reflectance is a measure of the relative amount of light reflected by a material under incident white light. It is expressed within an absolute range from 0 (minimum) to 255 (maximum) and specified as average value for the red (600-700 nm), green (500-600 nm) and blue (400-500 nm) color band (RGB system). The reflectance properties of sediments relate to their chemistry and structure and are dominated by pigmented trace constituents, typically Fe and Mn bearing minerals (clays, oxides, sulfides) and organic enrichments. Reflectance logs provide high-resolution records of terrigenous content (total reflectance) and redox state (red/blue ratio). Scanned at high spatial resolution, reflectance images provide sharp, undistorted, true-color core photographs scarcely affected by undesirable artefacts known from classical core photography (shadows, reflections etc.).

The digital imaging module of the GEOTEK MSCL consists of a camera containing three separate 3*1024 pixel CCD detectors mounted in the focal planes of split light beams ~40 cm above the surface of the sediment and equipped with red, green and blue dichroic filters. This camera captures consecutive, strictly orthogonal line images of the bypassing split core surface. The sediment is illuminated from above by two white fluorescent tubes. Freshly cut archive halves were carefully leveled to prevent shadows from residual surface roughness. All cores were scanned at an axial resolution setting of 100, corresponding to 1 row of pixels for every 100 µm in core depth. The resolution achieved across the core is nearly equivalent. The brightest part of each core was selected to determine the lens aperture value which allows the entire core to be measured on the same setting without saturating any of the color channels. Each reflectance value is calibrated against the range defined by a white tile (white calibration) and a closed lens cap (black calibration). Color test cards were measured before and after each core to determine and linearly correct drift effects of the CCD sensors.

A customized post-processing software was developed to perform all necessary image corrections and calculations. The processing starts out by cropping end-cap and cavity sections and by removing spurious color stripes caused by a non-uniform response of individual color channels. This task is efficiently solved by normalizing the means within each down-core column of data to the same mean-core value. The individual segment images are then merged into a full core image and numerically compressed in various ways. The median value of each data row was chosen as representative reflectance value in the depth series of red, green and blue reflectance, total reflectance (mean value of R, G and B) and for the red/blue ratio.

Contrast-enhanced color images were produced to improve the identification of layers, gradients, and textures. For this purpose, the RGB images were transformed to the equivalent hue, saturation and value (HSV) color system. By linearly expanding the data range of the value (intensity) parameter, the available contrast is broadened without shifting hue (dominant wavelength) and saturation (degree of purity) of each color, hence, the specific aspects of mineral color. In the standard processing, the 10% and 90% percentiles of V were determined for each core and linearly rescaled to a value range reaching from 25% to 75% total reflectance.

4.4.2 Shipboard Results

Sampling Sites and Recovery

During cruise P-342, 30 sediment cores with a cumulative length of 120 m from stations between 41.5 to 43° N and 9 to 9.75° W were investigated in terms of their physical properties

(Table 4.4.2.1). The coring locations comprise sediments from water depths between about 84 m (GeoB 11043-2) and 2045 m (GeoB 11035-1). Core lengths varied between 1.14 m (GeoB 11001-3) and 5.21 m (GeoB 11033-2).

General Results

The general characteristics of the physical properties, i.e. magnetic susceptibility and light reflectance, are compiled in the lower part of Figure X.1. Dots mark the mean values for the individual cores, vertical error bars denote their standard deviations. Each diagram is divided into groups of spatially adjacent cores.

Table 4.4.2.1: Cores subject to physical properties logging and core imaging (x performed, - not performed).

Core	Gear	PhysProps	Image
GeoB11001-3	VC	x	x
GeoB11002-2	GC	x	x
GeoB11002-3	VC	x	x
GeoB11003-3	VC	x	x
GeoB11004-2	VC	x	x
GeoB11005-2	VC	x	x
GeoB11007-2	VC	x	x
GeoB11008-2	VC	x	x
GeoB11009-2	VC	x	x
GeoB11010-2	VC	x	x
GeoB11011-2	VC	x	x
GeoB11014-2	VC	x	x
GeoB11015-2	VC	x	x
GeoB11016-2	VC	x	x
GeoB11019-2	VC	x	x
GeoB11020-2	VC	x	x
GeoB11024-2	GC	x	x
GeoB11025-2	VC	x	x
GeoB11027-2	VC	x	x
GeoB11028-2	VC	x	x
GeoB11029-2	VC	x	x
GeoB11030-2	VC	x	x
GeoB11033-2	GC	x	x
GeoB11034-1	GC	x	x
GeoB11035-1	GC	x	x
GeoB11039-3	GC	x	x
GeoB11040-2	VC	x	x
GeoB11041-2	VC	x	-
GeoB11042-2	VC	x	-
GeoB11043-2	VC	x	-

Overall mean magnetic susceptibility (Fig. 4.4.2.1) is about 267 10-6 SI. The highest values of about 1600·10-6 SI and the highest variability (standard deviation) are found in the sediments of core GeoB11015-2 from the northernmost profile F. Lowest mean susceptibility (72 10-6 SI) was determined for core GeoB11043-2.

The heterogeneous sedimentary environment of the working area is reflected by missing general trends according to water depths or localities, although cores from more northern locations seem to show less variability (lower standard deviations) in magnetic susceptibility. Sediments from the outer part of profile B show the most uniform signals with a mean susceptibility of about 175 10-6 SI and reduced standard deviations. These sediments comprise the cores from largest water depth (GeoB11033-2, 11034-2, 11035-2) and surprisingly one core from the deeper shelf area (GeoB11007-2) from a water depth of 183 m.

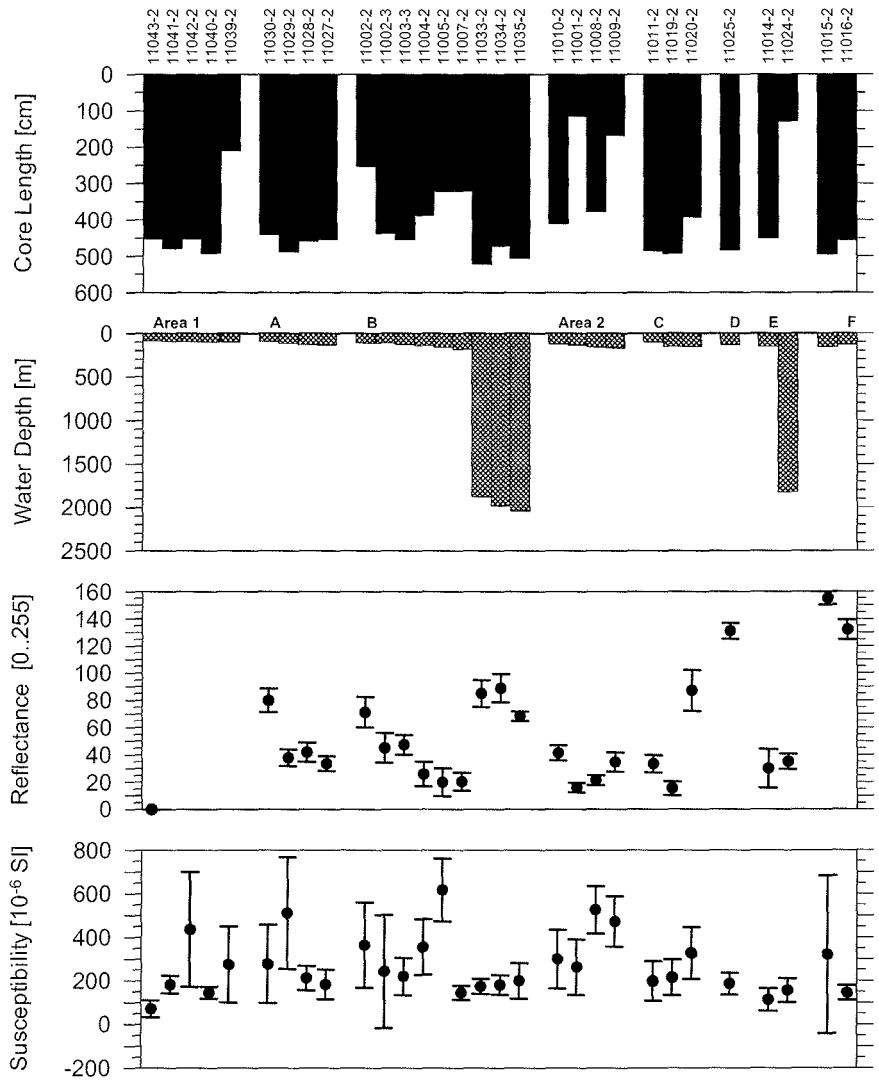


Fig. 4.4.2.1 Mean reflectance and magnetic susceptibility of cores GeoB 11001-2 through GeoB 11043-2 compared to variations in water depth at the sampling sites and core recovery. The vertical error bars denote standard deviations. Areas (1, 2) and profiles (A through F) are labeled according to Fig. 4.4.2.1.

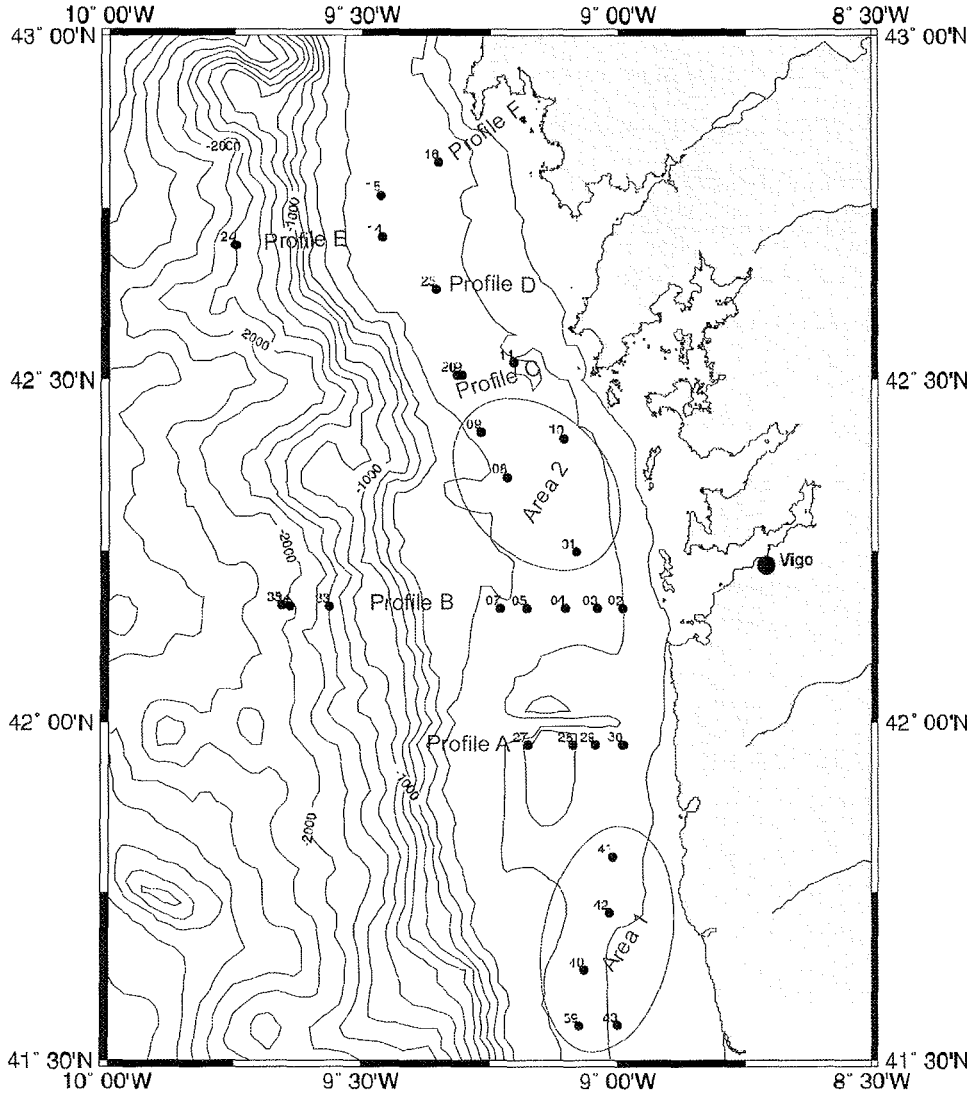


Fig. 4.4.2.1 Map of working area showing the locations of areas 1 and 2, and profiles A through F, respectively.

Sediment sequences containing high amount of mussels are characterized by lower values of magnetic susceptibility whereas no systematic correlation between susceptibility and sediment reflectance nor sediment color was found.

Physical property logs for each individual core are shown in section 4.3 compiled with core descriptions.

4.5 Organic Geochemistry

(M. Elvert, F. Schmidt)

4.5.1 Geochemical Background and Techniques

To assess organic matter distribution and its temporal and spatial changes at the shelf system, different organic geochemical approaches is used. One approach is the measurement of compound-specific carbon-isotope ratios by GC-IRMS of biomarkers derived from different environments. Together with radiocarbon-dating of these specific biomarkers by AMS (accelerator mass spectrometry) it will be applied for the identification of sources and transport pathways of organic matter. Biomarkers from the terrestrial environment are for example amyrin, long-chain n-alkanes and n-alcohols, which derive from leaf waxes of higher plants. The abundance of these compounds will be compared to marine-derived biomarkers (alkenones and steroids such as cholesterol or dinosterol) and bacterial markers (e.g. bishomohopanol) in respect to variations of their distribution and storage time. Ultrahigh-resolution mass spectrometry measurements of DOM and sediment extracts will be utilized to obtain detailed molecular information of complex organic matter mixtures. These data can be processed in element ratio plots to visualize the proportions of the different sources of organic matter. Additionally, the calculation of the BIT-index (Branched and Isoprenoid Tetraether index, Hopmans et al., 2004) using HPLC-MS (high performance liquid chromatography mass spectrometry) allows the determination of terrestrial input by comparing the relative abundance of terrestrial-derived branched tetraethers versus marine-derived crenarchaeol.

4.5.2 Shipboard Results

Surface samples were taken from the GBC containing the upper 2 cm of the sediment. At selected stations, pore water (volume of 50 mL) was taken by Rhizon sampling in the same depth interval of the GBC (Fig. 4.5.2.1. Rhizons have a permeable tube with 0.1 µm pores and the pore water is obtained by placing the sample under vacuum using a Luer-lock syringe. Pore water samples were sealed and stored at +4 °C in the dark. Sediment samples were stored at -20 °C in the dark to avoid organic matter degradation. Selected cores obtained by gravity- or vibro-coring were also sampled on board. All sediment and pore water samples are listed in Tab. 4.5.2.1. Coordinates of each station are given in chapter 4.3.

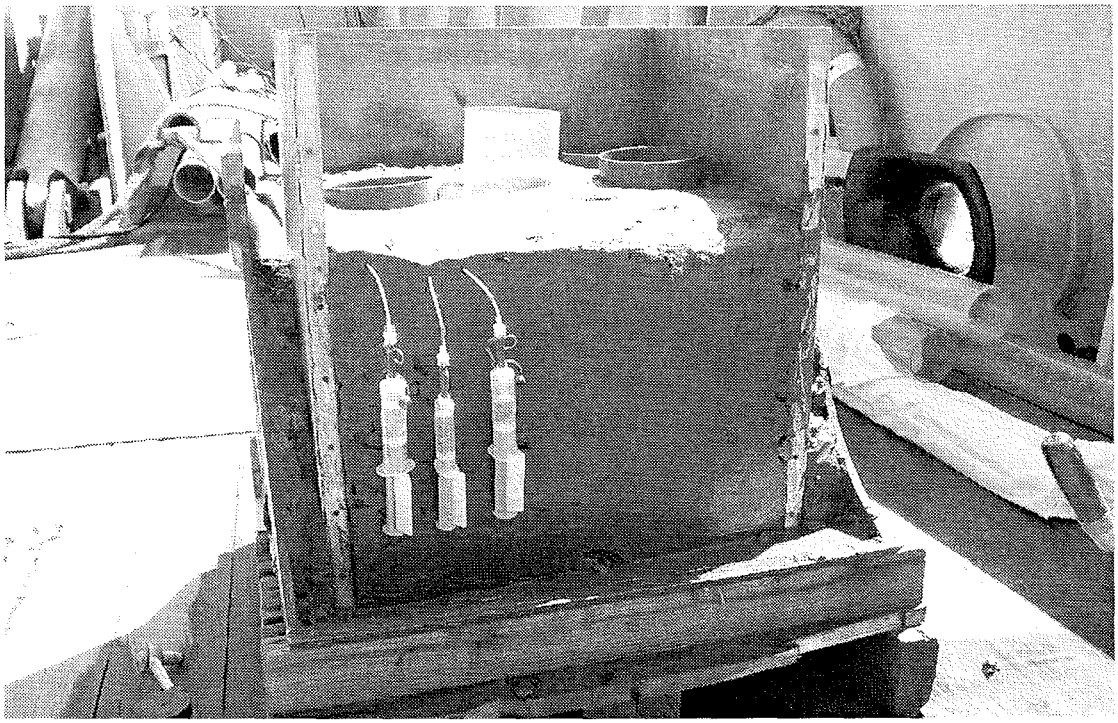


Fig. 4.5.2.1: Pore water sampling in an opened GBC (Rhizon sampling, station GeoB 11033-1).

Tab. 4.5.2.1: Sampling list of GBC, GC, and VC.

Station	Instrument	Sediment depth	Porewater (DOM)
GeoB11001-2	GBC	0-2 cm	yes
GeoB11002-1	GBC	0-2 cm	yes
GeoB11002-3	VC	20-23 cm, 50-53 cm ...every 30 cm... 390-393 cm, 420-423 cm	
GeoB11003-2	GBC	0-2 cm	
GeoB11003-3	VC	10--12 cm, 30-32.5 cm, 70-73 cm, 130-132.5 cm, 210-213 cm, 270-272.5 cm, 330-332.5 cm, 400-402.5 cm	
GeoB11004-1	GBC	0-2 cm	
GeoB11005-2	VC	70-73 cm, 170-173 cm, 307-310 cm	
GeoB11005-1	GBC	0-2 cm	
GeoB11006-1	GBC	0-2 cm	yes
GeoB11007-1	GBC	0-2 cm	
GeoB11008-1	GBC	0-2 cm	
GeoB11009-1	GBC	0-2 cm	yes
GeoB11010-1	GBC	0-2 cm	yes
GeoB11010-2	VC	70-73 cm, 100-103 cm, 130-133 cm, 159-162 cm, 172-175 cm, 213-216 cm, 270-273 cm	
GeoB11011-1	GBC	0-2 cm	
GeoB11012-1	GBC	0-2 cm	yes
GeoB11013-1	GBC	0-2 cm	
GeoB11014-1	GBC	0-2 cm	
GeoB11015-1	GBC	0-2 cm	

GeoB11015-2	VC	10--13 cm, 40-43 cm 80-83 cm, 130-133 cm 190-193 cm, 260-263 cm 285-288 cm, 350-353 cm 385-388 cm, 410-413 cm 440-443 cm, 480-483 cm	
GeoB11016-1	GBC	0-2 cm	yes
GeoB11017-1	GBC	0-2 cm	
GeoB11018-1	GBC	0-2 cm	yes
GeoB11019-1	GBC	0-2 cm	
GeoB11020-1	GBC	0-2 cm	
GeoB11021-1	GBC	0-2 cm, 10-12 cm 20.5-22 cm, 28-30 cm	yes
GeoB11022-1	GBC	0-2 cm, 10-12 cm, 20-22 cm 30-32 cm	yes
GeoB11023-1	GBC	0-2 cm	yes
GeoB11024-1	GBC	0-2 cm	yes
GeoB11024-2	GC	8-10 cm, 14-16 cm 22-24 cm, 40-42 cm 90-92 cm, 110-112 cm 119-121 cm	
GeoB11025-1	GBC	0-2 cm	
GeoB11027-1	GBC	0-2 cm 10-12 cm 20-22 cm	yes
GeoB11028-1	GBC	0-2 cm 10--12 cm 20-22 cm 30-32 cm	
GeoB11028-2	VC	80-83 cm 110-113 cm 200-203 cm	
GeoB11029-1	GBC	0-2 cm 10-12 cm 20-22 cm 30-32 cm	
GeoB11029-2	VC	90-93 cm, 120-123 cm 150-153 cm, 190-193 cm 220-223 cm, 250-253 cm 290-293 cm, 337-340 cm 360-363 cm, 392-395 cm 450-453 cm	
GeoB11030-1	GBC	0-2 cm 10-12 cm 25-27 cm	yes
GeoB11030-2	VC	50-53 cm, 70-73 cm 110-113 cm, 140-143 cm 200-203 cm, 250-253 cm 310-313 cm, 410-413 cm	
GeoB11030-1	GBC	0-2 cm	
GeoB11031-1	GBC	0-2 cm	
GeoB11032-1	GBC	0-2 cm	
GeoB11033-1	GBC	0-2 cm	yes
GeoB11033-2	GC	9-10 cm / 10-11 cm 19-20 cm / 20-21 cm 29-30 cm / 30-31 cm 49-50 cm / 50-51 cm 69-70 cm / 70-71 cm 89-90 cm / 90-91 cm	
station	**instrument**	**sediment depth**	**Porewater (DOM)**
GeoB11033-2 *continued*		109-110 cm / 110-111 cm 129-130 cm / 130-131 cm 154-155 cm / 155-156 cm 189-190 cm / 190-191 cm	

		209-210 cm / 210-211 cm	
GeoB11034-1	GC	1-2 cm / 2-3 cm 9-10 cm / 10-11 cm 19-20 cm / 20-21 cm 34-35 cm / 35-36 cm 49-50 cm / 50-51 cm 69-70 cm / 70-71 cm 89-90 cm / 90-91 cm 109-110 cm / 110-111 cm 129-130 cm / 130-131 cm 149-150 cm / 150-151 cm 169-170 cm / 170-171 cm 190-191 cm / 191-192 cm 209-210 cm / 210-211 cm	
GeoB11035-1	GC	1-2 cm / 2-3 cm 10-11 cm / 11-12 cm 19-20 cm / 20-21 cm 29-30 cm / 30-31 cm 49-50 cm / 50-51 cm 69-70 cm / 70-71 cm 94-95 cm / 95-96 cm 111-112 cm / 112-113 cm 129-130 cm / 131-132 cm 149-150 cm / 150-151 cm 169-170 cm / 170-171 cm 189-190 cm / 190-191 cm 207-208 cm / 208-209 cm	
GeoB11036-1	GBC	0-2 cm	
GeoB11037-1	GBC	0-2 cm	
GeoB11038-1	GBC	0-2 cm	
GeoB11039-1 GeoB11039-3	GBC GC	0-2 cm, 12-14 cm, 20-22 cm, 24-26 cm, 38-40 cm 10-12 cm, 30-32 cm ...every 20 cm... 170-172 cm, 190-192 cm	yes
GeoB11040-1	GBC	0-2 cm	
GeoB11041-1	GBC	0-2 cm	yes
GeoB11042-1	GBC	0-2 cm	yes
GeoB11043-1	GBC	0-2 cm	
GeoB11044-1	GBC	0-2 cm	

4.6 Sampling by our collaboration partners

4.6.1 Analyses at the Departemento de Xeociencias Mariñas e Ordenación do Territorio (Group of Oceanographical Geology and Biogeochemistry), Universidade de Vigo, Spain

The general objective of our group is put on the paleoclimatic and paleocenographic evolution of the Galician continental shelf and slope during the Late Pleistocene and Holocene. In particular, we will focus on the millennial (Milankovitch scale) and submillennial (Bond and Dansgaard-Oeschger cycles) climate variability.

Specific objectives are:

- To establish the biostratigraphy of the sedimentary record.
- To identify the recorded climate periods at glacial-interglacial frequency.
- To identify abrupt climate changes, including Heinrich events, stadials and interstadials.
- To determine the paleoproductivity patterns in the region related to fluctuations of the upwelling regime and to Finisterre front, and thus the evolution of subsurface water masses (Eastern North Atlantic Central Water: subpolar end-member and subtropical end-member, ENACWsp vs. ENACWst).
- To evaluate the influence of the Mediterranean Outflow Water (MOW) on the Galicia continental slope.
- To depict a general conceptual model about the paleoceanographic evolution of the region during the last climate cycle.
- To deepen in the global, regional and local forcing mechanisms.

For these purposes we have selected in a first step 4-5 cores ranging from 100 to 2000 m depth and along a transect from Cape Finisterre to the Ría de Vigo (GeoB 11024, GeoB 11033, GeoB 11035, GeoB 11015). The selected depth and latitudinal ranges will allow tracing the latitudinal fluctuations of surface and intermediate water masses along the recorded period.

We will use two main tools for reconstruction: foraminifera assemblages and stable carbon and oxygen isotopes. The obtained results will be complemented, compared and correlated with proxies obtained by other groups (e.g. 14C dates, TOC, TIC, 15N, etc.).

During the first year we will focus on planktonic foraminifera assemblages as proxy of paleotemperature and as tracer of surface water masses dynamics. The particular tasks include:

- A high-resolution sampling of cores.
- A detailed characterization of samples based on microscope features (relative abundance of different components)
- To establish the planktonic foraminifera assemblages based on representative counts (at least 300 individuals per sample).
- To establish the ratio *Neogloboquadrina pachyderma* right coiling/*N. pachyderma* left coiling as an excellent marker of cold periods. Counts will be done over at least 1000 individuals.
- To describe the changes recorded by the planktonic foraminifera assemblages.
- To quantify surface water paleotemperatures according transfer functions based on planktonic foraminifera.
- To propose the chronostratigrapy of cores based on micropaleontological events. That includes classical biostratigraphy methods as well eco-stratigraphy and event-stratigraphy methods.
- To compare and discuss the obtained data with those obtained by other groups.

According the preliminary results it would be possible to concentrate the study in a particular period, increasing the sample resolution. Ultra-high resolution analysis will be done during the second and third years. Also, benthic foraminifera assemblages and stable isotope analysis will be undertaken during the second year. The first studied samples show that benthic foraminifera are scarce in deeper cores. According that fact, benthic assemblages would be established only for selected periods which will be determined according a better knowledge of cores.

Stable isotopes analysis will be carried out, if possible, on planktonic and benthic foraminifera as well in order to establish differences between surface and bottom waters. As far as possible, isotope analysis will be done on monospecific samples.

4.6.2 Analyses at the Département de Géologie et Océanographie in Bordeaux, France

The French "Département de Géologie et Océanographie" UMR CNRS 5805 EPOC (Environnements et Paléoenvironnements OCéaniques –Bordeaux I University) has a strong background on the study of the Galician continental shelf (Dias et al. 2002; Jouanneau et al.

2002...).The participation of a scientist (S. Bujan) from EPOC completed the sedimentology team on board, mainly to be responsible for sampling of box-corers.

The main objective of the EPOC scientist during GALIOMAR cruise-P342 was to sample most off the box corers collected during the campaign. Later, after consultation with others participants and in relation with previous studies (Jouanneau et al., 2002; Dias et al., 2002) two transects of stations will be selected from the shelf to the slope and the corresponding samples will be study.

Informations concerning the cores location and on board procedure are gathered in the table below:

Tab. 4.6.2.1: Sampling list and sampling procedure for the DGO sample set. Sampling was done every centimetre for the first 5 cm downcore, and then every 5 cm the bottom of the core. (*) Complementary sampling directly inside the Giant Box core, for the first two centimetres only.

Station identification	Date	Depth (m)	Latitude (N)	Longitude (W)	Length of core (cm)	Samples
GeoB 11001-2	20-August 06	135,5	42°14'59,6"	9°04'60,0"	35	(*)
GeoB 11002-1	22-August-06	111	42°09'59,7"	9°59'24,4"	32	(*)
GeoB 11011-1	23-August-06	100	42°31'36,8"	9°12'07,6"	22	
GeoB 11012-1	24-August-06	119	42°42'30,8"	9°15'57,6"	38	
GeoB 11013-1	24-August-06	130	42°42'28,6"	9°21'09,2"	31	
GeoB 11014-1	24-August-06	153	42°42'29,5"	9°27'40,1"	22	
GeoB 11015-1	24-August-06	158	42°46'10,8"	9°27'59,0"	30	(*)
GeoB 11020-1	26-August-06	154	42°30'23,0"	9°18'55,2"	28	
GeoB 11021-1	26-August-06	481	42°29'08,5"	9°25'31,5"		(*)
GeoB 11022-1	26-August-06	292	42°34'59,6"	9°25'17,2"	34	(*)
GeoB 11023-1	26-August-06	403	42°42'29,7"	9°33'25,9"	27	
GeoB 11024-1	26-August-06	1833	42°41'47,9"	9°44'59,3"	30	
GeoB 11027-1	29-August-06	137	41°57'59,8"	9°10'37,4"	26	
GeoB 11028-1	29-August-06	127	41°58'00,9"	9°05'32,2"	39	
GeoB 11029-1	29-August-06	115	41°57'59,8"	9°02'45,2"	36	
GeoB 11030-1	29-August-06	94	41°57'59,8"	8°59'23,9"	28	
GeoB 11033-1	31-August-06	1873	42°14'59,6"	9°04'60,0"	30	
GeoB 11037-1	01 Sept. 06	80	41°43'10,2"	8°58'47,8"	15	
GeoB 11038-1	01 Sept. 06	78	41°38'03,6"	8°58'28,4"	23	
GeoB 11039-1	01 Sept. 06	99	41°33'03,6"	9°04'39,6"	41	
GeoB 11040-1	01 Sept. 06	99	41°38'04,2"	9°04'03,0"	21	
GeoB 11041-1	02 Sept. 06	93	41°48'04,7"	9°00'38,3"	32	
GeoB 11042-1	02 Sept. 06	95	41°43'03,3"	9°01'08,4"	34	
GeoB 11043-1	02 Sept. 06	84	41°33'05,2"	9°00'02,9"	22	

All the sampled cores on board come from the Giant Box corer, as we need to study the first decimetres of the deposits. We plan to evaluate the on-going processes through estimates of thickness of the mixing layer and eventually calculate the accumulation rates from 210 Pb.

As reported in the Table, most of cores are sampled every cm from the interface to 5 cm sediment depth, and then, sampled every 5 cm. Sometimes it has been necessary to do intermediate sampling related to the observation of specific or unusual dynamics figures of the sedimentary column (at 7.5 cm depth). The samples were gathered by station in identified plastic bags and conserved on board inside a fridge (+4°c).

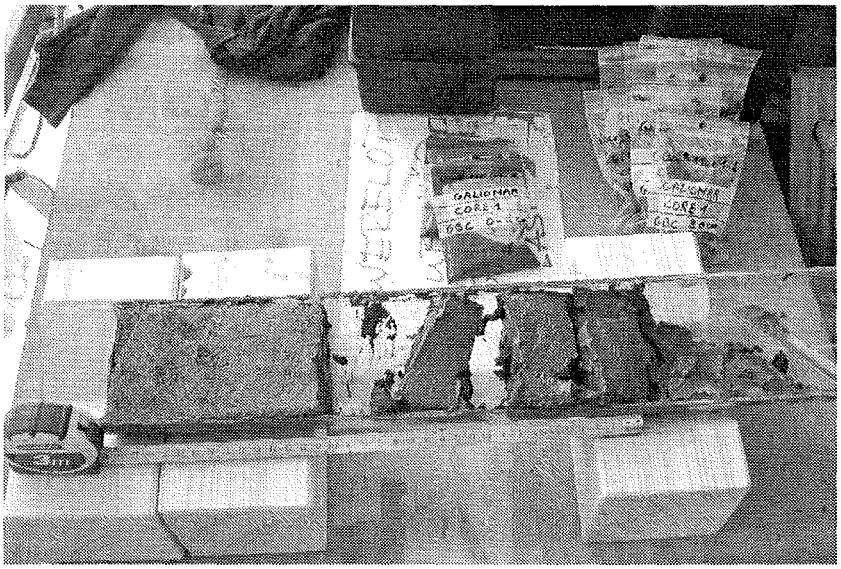


Fig. 4.6.2.1: Sedimentological Sampling of core from the Giant Box Core

Expected analysis:

We plan the following sedimentological analysis:

- Grain size analysis on fine-grained sediments using a with a Mastersizer S equipment (Malvern Instruments) using Laser Diffraction in Particle Size Analysis.
- Particular Organic Carbon analysis, determined using the Strickland and Parsons' method (1972) as adapted by Etcheber (1981). Its content is measured with a LECO CS-125 equipment.
- Radioisotopes (^{210}Pb) analysis on 2 selected transect of stations.

  Radioisotopic measurements, gamma spectrometry, should be made using a semi-planar germanium detector, (EGSP 2200-25-R from EURYSIS Measures) coupled to a multichannel (8000 channels) analyser.

Realization of this program is however linked to funds allocated by the contacting authority.

4.6.3 *Analyses at the Instituo Nacional de Engenharia, Technologia e Indurcão in Lisbon, Portugal*

The Lisbon group, headed by Fatima Abrantes, is very interested in collaborating with the Bremen Group, and in particular with Till Hanebuth on the study of the cores (box, vibro and gravity) recovered off NW the Iberian Peninsula during the Cruise Poseidon P-342.

The surface samples of all the sites, recovered by giant box corer will be used to study microfossils (diatoms, planktonic foraminifera, dynoflagellate cysts, phytoliths) abundance and assemblage composition and Organic Carbon determinations, in order to extend the already existing data bases of the different groups and that have been used in the definition of regional transfer functions.
Sites located within the so-called mud complexes (Fig. 4.6.3.1), located sensibly along the 100 m bathymetric would be of interest to do trace element and organic pollutants analysis, both on the surface samples as along a couple of cores to be selected on the basis of the cores description, and non-destructive parameters (color, MS, XRF data). The objective of this study is to investigate temporal evolution of pollution, type of used pollutants and its export to the coastal areas.
From the sites collected within the mud complexes, where sedimentation rate is expected to be higher, a couple of gravity cores could also be selected to reconstruct Holocene climatic and oceanographic conditions.

The sites that define the two transects perpendicular to the coast, at 42° 10' N and 42° 40' N, if having high sedimentation rate and continuous hemipelagic sedimentation, would be of interest for our group to reconstruct past circulation and productivity conditions on the basis of microfossil (diatoms, planktonic foraminifera), Organic Carbon content, ∂18O isotopes on benthic and planktonic foraminifera, and possibly also Mg/Ca on planktonic foraminifera.
Our interests will be accommodated according to the Bremen group priorities and objectives, and also considering the interest of the Vigo and Bordeaux groups, which have also demonstrated interest in contributing to the study of this material.

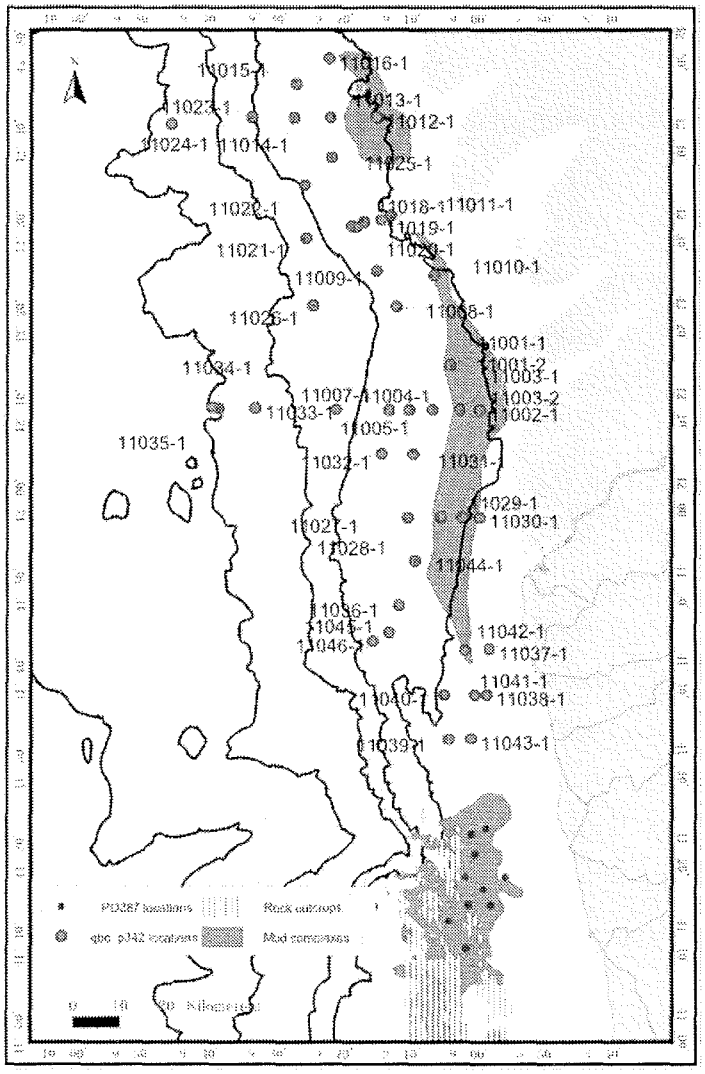


Fig. 4.6.3.1 Locations of surfaces samples

5. Acknowledgements

Captain Michael Schneider and his team – on behalf for the whole bridge, deck and technical crew – should be loudly thanked for their outstanding support in all eventualities and during the whole cruise. The harmonic and constructive interplay between scientific team and ship crew was a unforgettable experience and has definitively contributed significantly to the success of this cruise. Some of us have maybe even discovered their love to the "Vibrolady" (alternatively "Rüttelsusi") which made us altogether busy every day.

We thank Götz Ruhland for the professional logistics, the RCOM-Werkstatt for the construction of special tool elements, and Volker Diekamp for the material management. Thanks also to Helga Heilmann who has helped to organize the material preparation.

Prof. Gerold Wefer, as the director of the DFG-RCOM, has provided logistic equipment.

We also would like to thank the Reederei Briese for their backing during the solution-search regarding the complications with agency in Vigo.

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Appendix:

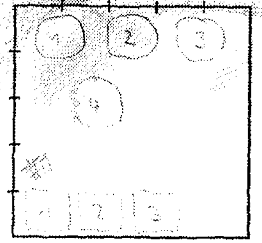
Descriptions of Surfaces and Profiles of Giant Box Cores

Reise	GKG PROTOKOLL	
Stationsnummer: GeoB 11001-2	Bearbeiter: Schmidt	Datum: 20.08.2006

BEPROBUNG

Eindringung (cm)	34	Bemerkungen
Sediment - Temp. (° C)	13,1	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

sandy mud [illegible] of small carbonate fragments, heavy minerals, very thin [illegible], crabs, smooth surface, brownish grey colour, few worms

1) surface cup [illegible]

2) sediment liner, [illegible]

3) whole surface sample

- pore water 40ml

[illegible] plastic cups

OBERFLÄCHEN - PROBEN (cm²)

Foraminiferen (gefärbt)	2 x 10	Fauna (Spritze 10 ml)		
Foraminiferen	1 x 10	Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	✓
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	✓

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von bis
RP 1	
RP 2	

FRAKTION >1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 -> cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer: GeoB 11001-2	Bearbeiter: Hanebuth	Datum: 20. Aug. 2006

KERNBESCHREIBUNG

Eindringung (cm)	35	Bemerkungen
Sediment - Temp. (° C)	13	

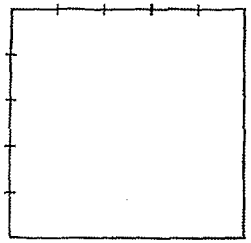
Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm – 50		2.5Y 3/1		O; SS	very dark grey fine sandy mud, some medium sandy shell fragments; increasing water content to the top: relatively stiff at the bottom, soft at the uppermost part. moderately bioturbated, single large burrows

Reise P342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11002-1	Schmidt	22.08.2006

BEPROBUNG

Eindringung (cm)	32	Bemerkungen
Sediment - Temp. (° C)	13,2	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

silty mud, very soft, fluffy layer
some crab burrows 1cm, long ripples
brownish dark grey parts with fine sand
on the very surface

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomaen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION >1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 -> cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11002-1	Hendrik	22.08.2006

KERNBESCHREIBUNG

Eindringung (cm)	29	Bemerkungen
Sediment - Temp. (° C)		

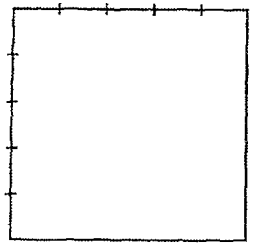
Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		2,5 Y 3/1 very dark grey			muddy fine sand finer to base (muddy coarse silt), very homogenous, white mica
5					
10					
15					
20					
25					
29cm					
30					
35					
40					
45					
50					

Reise P 342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11003 - 2	Bearbeiter Schmidt	Datum 22.08.2006

BEPROBUNG

Eindringung (cm)	41	Bemerkungen
Sediment - Temp. (° C)	13.1	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

mud, soft fluffy layer
some mud burrows, some crabs
some worm burrows
olive, slightly irregular surface

no pore water sampling

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11003-2	Bearbeiter Haeckel	Datum 23. Aug. 06

KERNBESCHREIBUNG

Eindringung (cm)	39 cm	Bemerkungen
Sediment - Temp. (° C)		

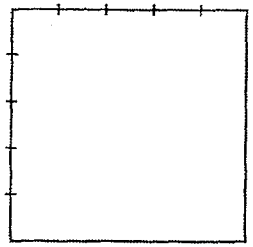
Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		2.5Y 3/3		SS	dark olive brown mica - rich Mud, some foams, moderately bioturbated, very soft
22		2.5Y 3/1		O SS	very dark grey Mud, Mica is abundant stiffer than unit above, moderately bioturbated, two open burrows (~1cm in diameter)
40					
50					

Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11004-1	Bearbeiter Schmidt	Datum 22.08.06

BEPROBUNG

Eindringung (cm)	34 cm	Bemerkungen: seawater pouring out
Sediment - Temp. (° C)	12,8	

Auftellung der Oberfläche



Beschreibung der Oberfläche

sand, glauconitesand, many worm burrows & tubes, irregular surface no fluffy layer middle brown colour, black glauconite sand

no pore water sampling

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11004-1	Bearbeiter Hanebuth	Datum 27. Aug 06

KERNBESCHREIBUNG

Eindringung (cm)	32	Bemerkungen
Sediment - Temp. (° C)		

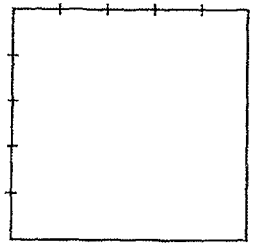
Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		sandier portion: 5Y 2.5/1 black; finer portion: 5Y 3/2 dark olive gray			0-2 cm: soft muddy glauconite sand 2-30 cm: moderately to heavily bioturbated clayey glauconite sand locally patchy darker various portions of sandier & finer areas as result of bioturbation base sand-laminated
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11035-1	Bearbeiter Schmiedl	Datum 22.08.2006

BEPROBUNG

Eindringung (cm)	23	Bemerkungen surface partly destroyed by outpouring water
Sediment - Temp. (° C)	13.3	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

glauconitic sand (fine) with dolite
some worm tubes, brown mud clasts in fine s
no core catcher
no pore water sampling

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

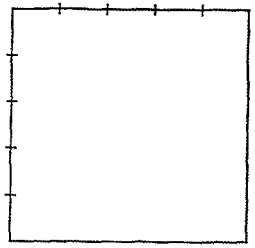
Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

Reise P342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11006-1	Schmidt	22.08.2006

BEPROBUNG

Eindringung (cm)	26.0	Bemerkungen: surface disturbed by outpouring water
Sediment - Temp. (° C)	12,7	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

silty mud, olive, no fluffy layer
few parts with glauconite sand similar surface
some wormtubes

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11006-1	Schmidt	28.08.06

KERNBESCHREIBUNG

Eindringung (cm)	24	Bemerkungen
Sediment - Temp. (° C)		

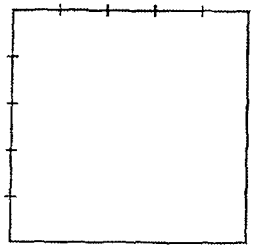
Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5Y 4/3		S	0-24cm: silty fine sand olive few small carbonate fragments weakly bioturbated wormtube (2cm)
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

Reise P 342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11007-1	Bearbeiter Schmidt	Datum 22.08.2006

BEPROBUNG

Eindringung (cm)	25	Bemerkungen
Sediment - Temp. (° C)	12,4	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

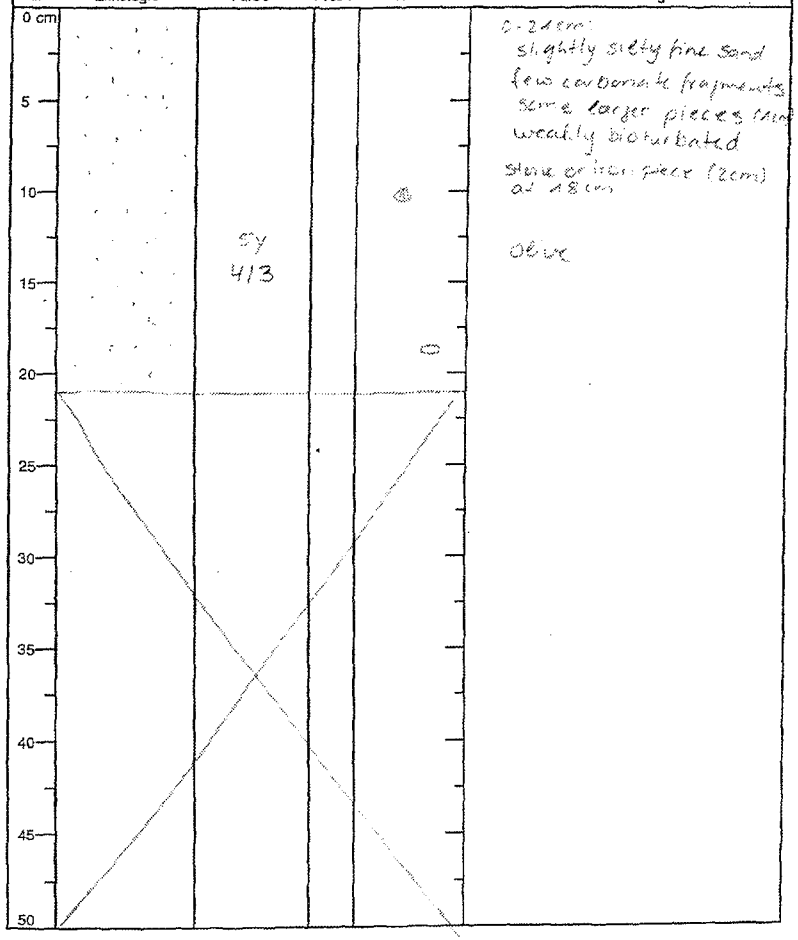
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11007-1	Bearbeiter Schmidt	Datum 28.08.06

KERNBESCHREIBUNG

Eindringung (cm)	21	Bemerkungen
Sediment - Temp. (° C)		

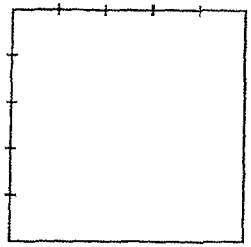


Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11008-1	Bearbeiter Schmidt	Datum 23.08.06

BEPROBUNG

Eindringung (cm)	28cm	Bemerkungen surface drained by outpouring water.
Sediment - Temp. (° C)	13,1	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

greenish sand, dark brown at the start, several worm tubes, some rocks via fragments

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11008	Bearbeiter Lantzsch	Datum 04.09.2006

KERNBESCHREIBUNG

Eindringung (cm)	26	Bemerkungen
Sediment - Temp. (° C)		

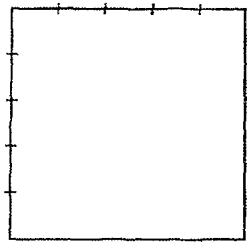
Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		2,5 Y 2,5/1		SS	black fine- to medium sand very abundant glauconite moderately bioturbated dispersed shell frags. only locally increased amount from 11 to 26cm (up to 5mm Ø) SS

Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11009-1	Bearbeiter Schmidt	Datum 23.8.06

BEPROBUNG

Eindringung (cm)	34	Bemerkungen
Sediment - Temp. (°C)	13,4	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

surface partly disturbed
glauconite sand, fluffy layer,
several worm tubes
brown (mud) sand) - no bioturbation

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11009-1	Bearbeiter Bender	Datum 30. Aug. 06

KERNBESCHREIBUNG

Eindringung (cm)	28 cm	Bemerkungen
Sediment - Temp. (°C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		2.5Y 3/2			(0-28cm) very dark greyish brown muddy medium sand, glauconite-rich (increased content @ uppermost 5cm to 2cm), partly mud enriched lenses (less content of glauconite here) bioturbation? From 3cm depth towards bottom: some carbonate shell fragments (up to 5mm in size). ★ shell layer most 2cm
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

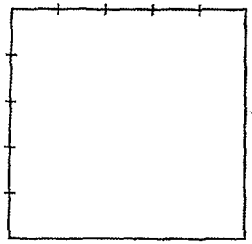
Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB 11010-1**	Bearbeiter Schmidt	Datum 23.08.06

Foto 08240005, 0006/

BEPROBUNG

Eindringung (cm)	40	Bemerkungen
Sediment - Temp. (° C)	13.3	

Auflagerung der Oberfläche



Beschreibung der Oberfläche

dominated by [illegible] coral [illegible] debris [illegible] some small carbonate fragments

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

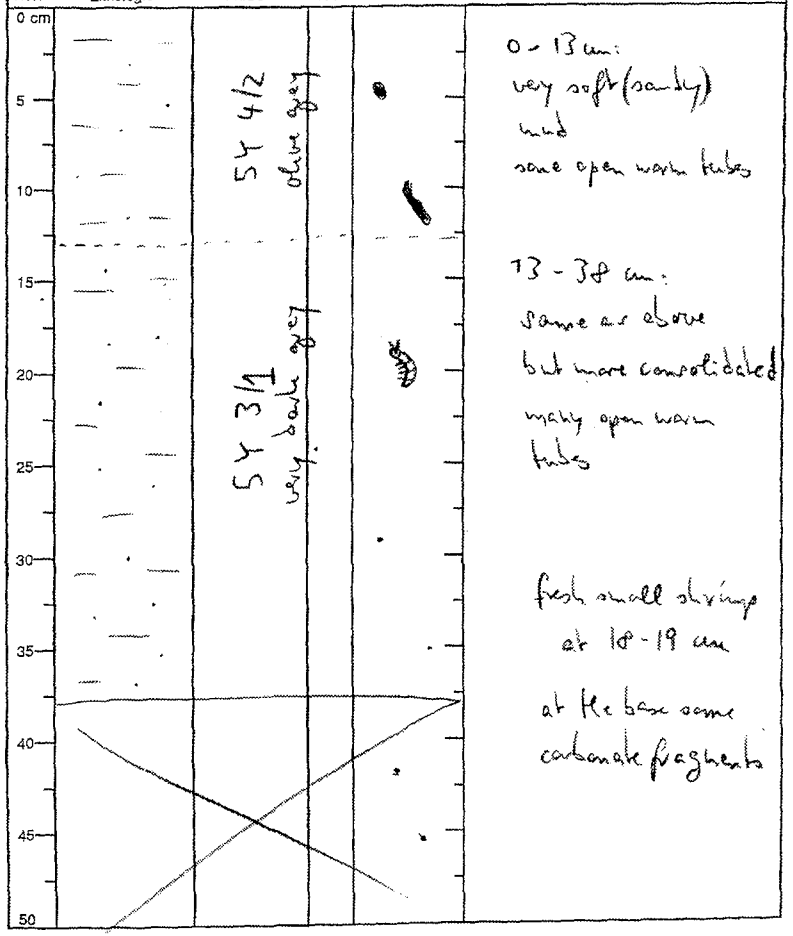
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB 11010-01**	Bearbeiter Hanebuth	Datum 27. Aug 06

KERNBESCHREIBUNG

Eindringung (cm)	38	Bemerkungen
Sediment - Temp. (° C)		strong fishy

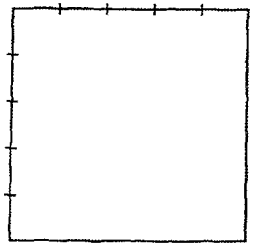


Reise P 342	GKG PROTOKOLL	
Stationsnummer **GeoB 11011-1**	Bearbeiter Schmidt	Datum ~~23~~ 23.8.06

BEPROBUNG

Eindringung (cm)	25	Bemerkungen: surface partly destroyed by outflowing water.
Sediment - Temp. (° C)	11,3	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

middle - coarse grained sand
no fluffy layer, also at cracks, mussel
some worm tubes, several carbonate
fragments, slight gastric middle
iron at 20 cm

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB 11011-1**	Bearbeiter Hanebuth / Bender	Datum 26. Aug. 06

Foto # 52

KERNBESCHREIBUNG

Eindringung (cm)	24	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		10YR 4/3			(0-20 cm) brown medium to coarse sand, medium = glauconite, coarse = shell fragments, abundant shell fragments up to 2 cm in size. (6-11 cm depth = slightly muddy)
20		10YR 3/1			(20-24 cm) ~~muddy~~ very dark grey same as above but muddy
25					
30					
35					
40					
45					
50					

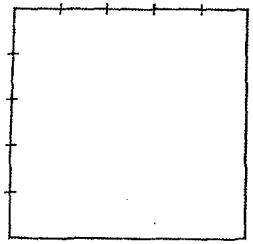
Reise P342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11012-1	Schmidt	24.08.06

Foto 3, 4,

BEPROBUNG

Eindringung (cm)	39	Bemerkungen
Sediment - Temp. (° C)	11,2	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

silty mud, olive, fluffy layer, [illegible] consistency, [illegible] burrows, [illegible] irregular surface, worm tubes

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11012-1	Schmidt	28.08.06

KERNBESCHREIBUNG

Eindringung (cm)	39 cm	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5Y 4/2			0-3 cm: olive grey soft muddy fine sand
5		5Y 2.5/2			3-14 cm: black muddy fine sand highly clay content thin alone
10					
15		2.5Y 3/2			14-29 cm slightly fine sandy silty clay very dark greyish brown moderately bioturbated some small shell fragments
20					
25					
30		5Y 2.5/2			29-39 cm black slightly fine sandy clayey silt moderately bioturbated abundant small shell fragments some larger pieces (2cm)
35					
40					
45					
50					

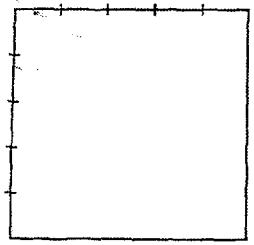
Reise P342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11013-1	Schmidt	24.08.06

Nr. 8/3

BEPROBUNG

Eindringung (cm)	31	Bemerkungen
Sediment - Temp. (° C)	13,0	surface water decanted by centrifuge water

Aufteilung der Oberfläche



Beschreibung der Oberfläche

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11013-1	Schmidt	28.08.06

KERNBESCHREIBUNG

Eindringung (cm)	30,5	Bemerkungen
Sediment - Temp. (° C)		

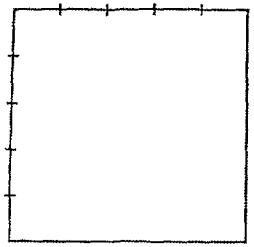
Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5y 3/2			0-28cm: muddy fine sand abundant glauconite sand dark olive gray moderate yellowish brown abundant mollusc carbonate fragments a shell rich
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

Reise P342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11014-1	Schmidt	24.8.06

Foto 9, 10, 14, 13, 12, BEPROBUNG

Eindringung (cm)	32	Bemerkungen
Sediment - Temp. (° C)	12,1	surface water oxidized by dropping

Aufteilung der Oberfläche



Beschreibung der Oberfläche

brown on olive grey sandy silt
with tube structures
patchy of a darker fine sandy
surface layer

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11014-1	Schmidt	28.08.06

KERNBESCHREIBUNG

Eindringung (cm)	22	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		2.5Y 3/3			0-22cm: dark olive brown slightly muddy fine sand abundant burrows and bioturbation some (larger pieces (mm) weakly bioturbated
5					
10				S	
15					
20					
25					
30					
35					
40					
45					
50					

Reise P 342	GKG PROTOKOLL	
Stationsnummer **GeoB 11015-1**	Bearbeiter Schmiedl	Datum 24.8.06

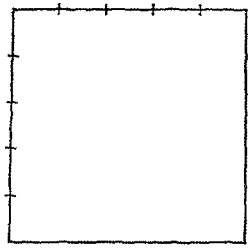
Foto # 11

BEPROBUNG

Bild ...

Eindringung (cm)	32	Bemerkungen
Sediment - Temp. (° C)	12,9	surface partly disturbed

Aufteilung der Oberfläche



Beschreibung der Oberfläche

fine grained sand, grey to brown
shells, foraminifera, worm tubes
fluffy layer, ... carbonate fragments
bivalves
... carbonate particles
and clay particles

no pore water sampling

OBERFLÄCHEN - PROBEN (cm²)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB 11015-1**	Bearbeiter Hanebuth	Datum 27. July 06

KERNBESCHREIBUNG

Eindringung (cm)	30	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5Y 2.5/2		4	0-30 cm black slightly muddy fine sand, some carbonate particles, homogenous
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

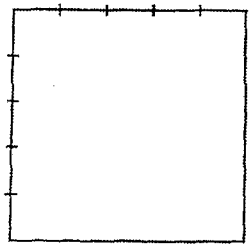
Reise P342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11016-1	Schmidt	24.8.06

15, 16

BEPROBUNG

Eindringung (cm)	26	Bemerkungen: surface partly destroyed
Sediment - Temp. (° C)	13,4	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

~~fine~~ fine grained sand, greyish brown
some carbonate fragments, worm tubes
smooth surface
some black particles

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomaen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11016-1	Lea Irion	30.8.2006

KERNBESCHREIBUNG

Eindringung (cm)	22 cm	Bemerkungen
Sediment - Temp. (° C)		

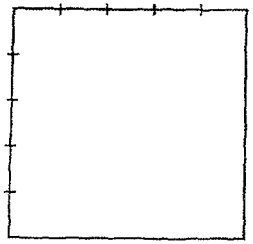
Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		2.5 Y 5/2		SS	very dark greyish brown homogen very fine sand containing some dispersed shell fragments (upto 5mm Ø) abundant gfeuerspitz
5					
10				SS	"nests" of shell - fragments from 8 to 11.5 cm and from 19 to 21 cm (in Sum = 50, upto 7cm diameter)
15				SS	one bg (2cm Ø) shell fragment at 17cm moderately bioturbated
20					
25					
30					
35					
40					
45					
50					

Reise P 342	GKG PROTOKOLL	
Stationsnummer **GeoB 11017-1**	Bearbeiter Schmidt	Datum 26.08.06

BEPROBUNG

Eindringung (cm)	22	Bemerkungen: surface partly disturbed
Sediment - Temp. (°C)	13.1	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

coarse grained sand in muddy matrix
greyish olive green some mud clast parts
worm tubes, some crabs, shells
no pore water sampling

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB 11017-1**	Bearbeiter Lantzsch	Datum 30.7.2006

KERNBESCHREIBUNG

Eindringung (cm)	23 cm	Bemerkungen
Sediment - Temp. (°C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		2.5 Y 3/3 very dk. grayish brown		55 - 55	upper 4 cm partly disturbed, no flat surface mixture of muddy and coarse sand to gravel due to bioturbation? irregularly dispersed muddy parts in a muddy coarse sand to gravel matrix worm tubes at 2 and 6 cm and many broken parts single bivalve shells at 12 and 13 cm (1 cm in length and 2 cm diameter) gravel - partly rounded to well rounded quartz, rock fragments, opaque minerals quartz is mainly subangular and well rounded moderately to strongly bioturbated 18 - 23 cm less muddy parts
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

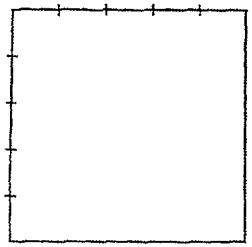
Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB 11018-1**	Bearbeiter Schmidt	Datum 26.08.06

11, 12, 13

BEPROBUNG

Eindringung (cm)	21	Bemerkungen: surface partly disturbed by outpouring water
Sediment - Temp. (° C)	13,2	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

muddy silt, greenish brown
sticky layer, worm tubes, shell
sand, shell debris, fragments
a certain amount of shell pieces, smaller
sediment

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB 11018-1**	Bearbeiter Schmidt	Datum 28.08.06

KERNBESCHREIBUNG

Eindringung (cm)	20	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5Y 4/2			0-10cm silty fine sand abundant small carbonate fragments olive gray 10-14cm slightly muddy fine sand olive gray enriched in shells & shell fragments (< 3cm) 14-20cm same as 0-10cm some larger carbonate fragments (2cm)
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

Reise	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11019-1	Schmidt	26.08.06

14,15 16,12 (abs.mp) 10-22

BEPROBUNG

Eindringung (cm)	28	Bemerkungen
Sediment - Temp. (° C)	13,0	

Aufteilung der Oberfläche

Beschreibung der Oberfläche

muddy fine sand, some glauconite sand, worm tubes, crabs, suprabenthic fauna, irregular surface brown

no pore water sampling

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11019-1	[illegible]	30.8.2006

KERNBESCHREIBUNG

Eindringung (cm)	26 cm	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		2.5Y 3/2			very dark greyish brown few organic fibres to medium round abundant glauconite some single shell fragments (< 5 mm) dense network of tubes 10-15cm irregularly shaped muddy parts with darkgrey glauconitic sand (burrows?) moderately bioturbated
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

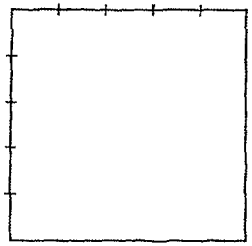
Reise	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11020-1	Schmidt	26.08.06

18, 19 + 23

BEPROBUNG

		Bemerkungen
Eindringung (cm)	29	surface partly discharged by outflowing water
Sediment - Temp. (° C)	12,7	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

muddy fine sand, brownish olive
glauconite sand, some carbonate hypum
worm tubes
irregular surface

recent water sample

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

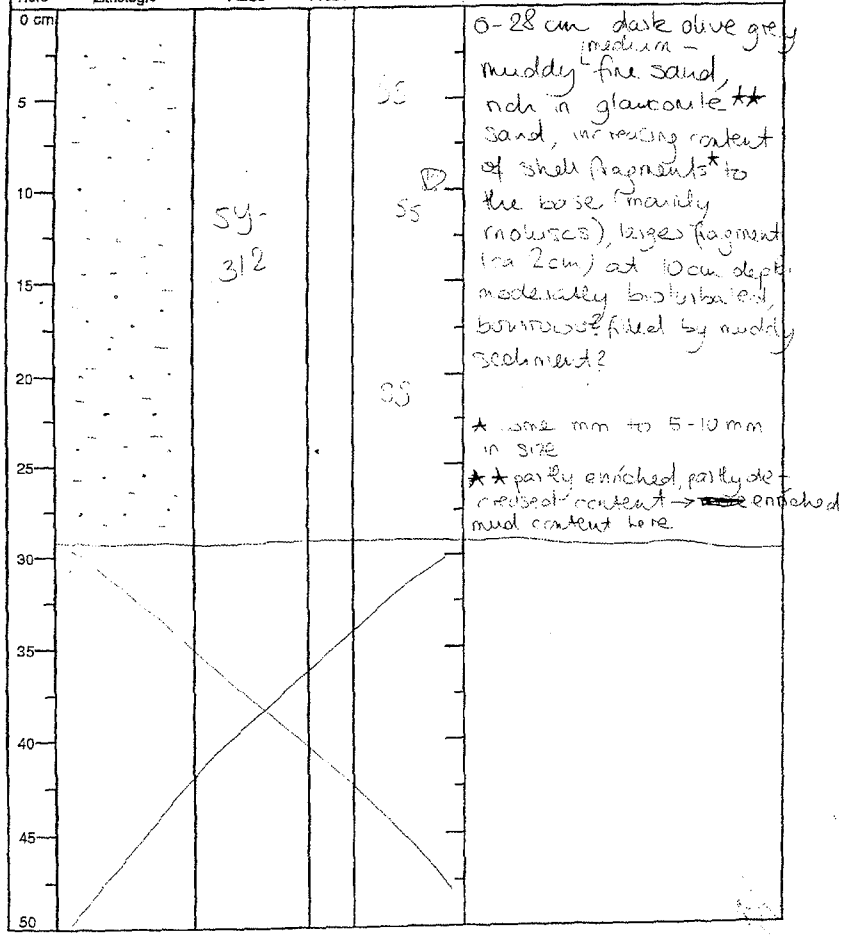
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11020-1	Bendes	30 Aug 06

KERNBESCHREIBUNG

		Bemerkungen
Eindringung (cm)	28cm	
Sediment - Temp. (° C)		



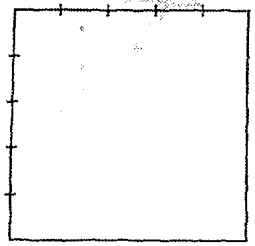
Reise P342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11021-1	Schmidt	26.08.06

Foto # 25-28 29-31

BEPROBUNG

Eindringung (cm)	30	Bemerkungen: surface partly destroyed
Sediment - Temp. (° C)	11.8	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

muddy fine sand, olive colours
homogeneous
few dispersed shell fragments
abundant mica
irregular surface

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11021-1	Schmidt	26.08.2006

KERNBESCHREIBUNG

Eindringung (cm)	30	Bemerkungen: top of box core partly washed out
Sediment - Temp. (° C)		

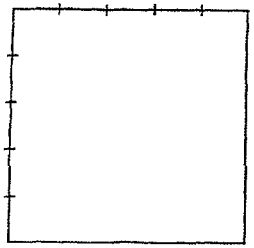
Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		2.5 Y 3/2 (very dark grayish brown)		SS	muddy fine to medium sand homogenous few dispersed shell fragments (mono Sharp #) abundant mica water content increasing towards top (due to washing out of the box corer on deck?) medium bioturbation (worm at 44 cm) well sorted
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

Reise P 342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11022-1	Schmidt	26.08.06

40, 41, 42 → Ethmocaa **BEPROBUNG**

Eindringung (cm)	38	Bemerkungen
Sediment - Temp. (° C)	12,2	

Auftellung der Oberfläche



Beschreibung der Oberfläche

irregular surface, fine sand, olive-brown
bulk glauconitic sand, fluffy layer
Echinoidea, worm burrows, shell
some carbonate fragments

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 -> cm	

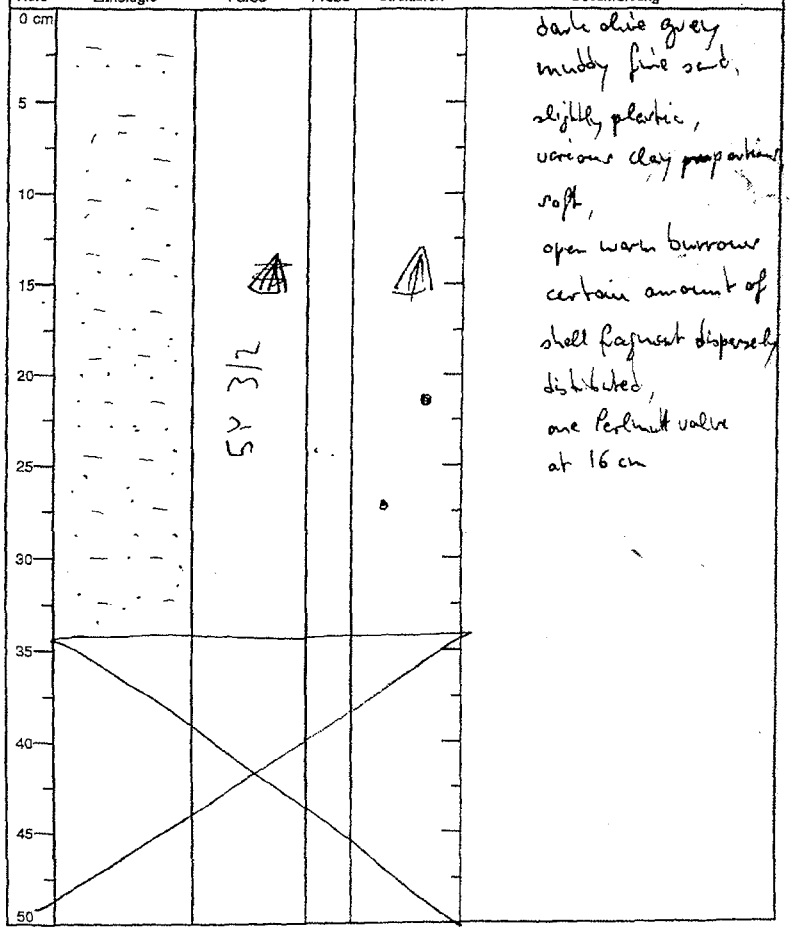
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11022-1	Hanebuth	26. Aug 06

KERNBESCHREIBUNG

Eindringung (cm)	34	Bemerkungen
Sediment - Temp. (° C)		



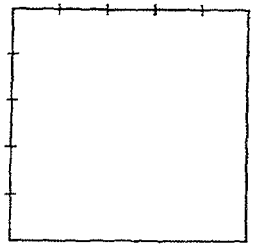
Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11023-1	Bearbeiter Schmiedl	Datum 26.08.06

46,

BEPROBUNG

Eindringung (cm)	33	Bemerkungen: surface partly destroyed
Sediment - Temp. (° C)	12.3	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

very muddy, fine sandy, organic rich, a certain amount of shell particles, mica worm tubes, a crab
smooth surface, ~~some~~ a few smaller carbonate fragments

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

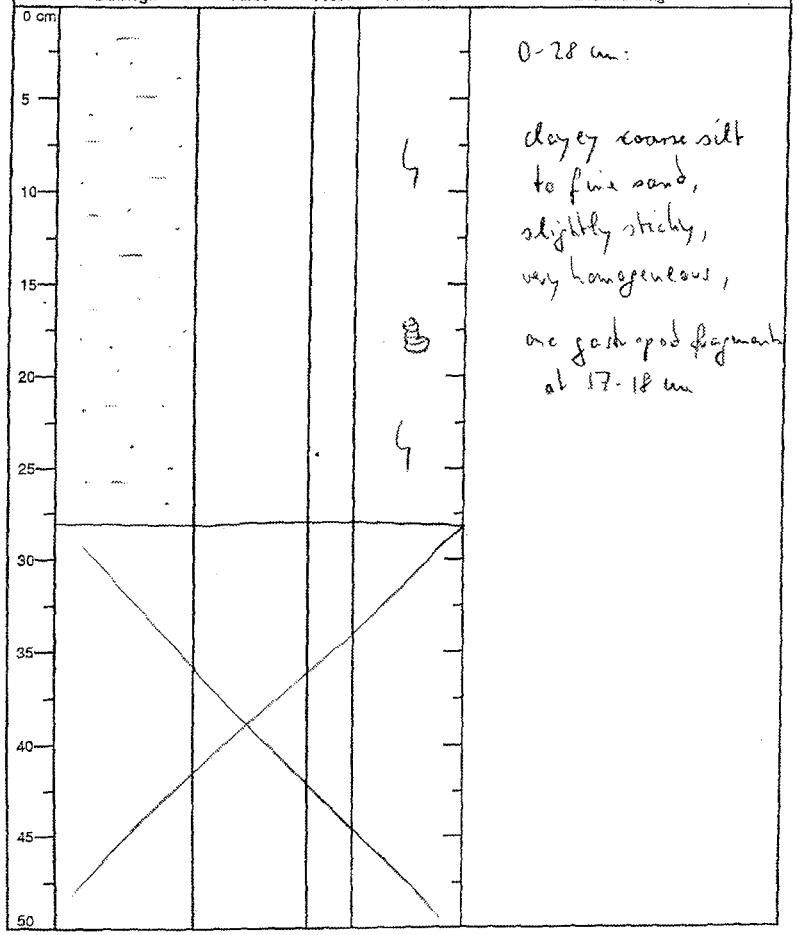
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11023-1	Bearbeiter Haeckel	Datum 27. Aug. 06

KERNBESCHREIBUNG

Eindringung (cm)	28	Bemerkungen
Sediment - Temp. (° C)		



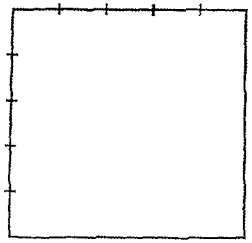
Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB 11024-1**	Bearbeiter Schmidt	Datum 26.08.06

59,60

BEPROBUNG

Eindringung (cm)	32	Bemerkungen
Sediment - Temp. (° C)	5.3	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

silty mud, dark [illegible]
small [illegible] tubes, Hetiopora
Bryozoa

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION >1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

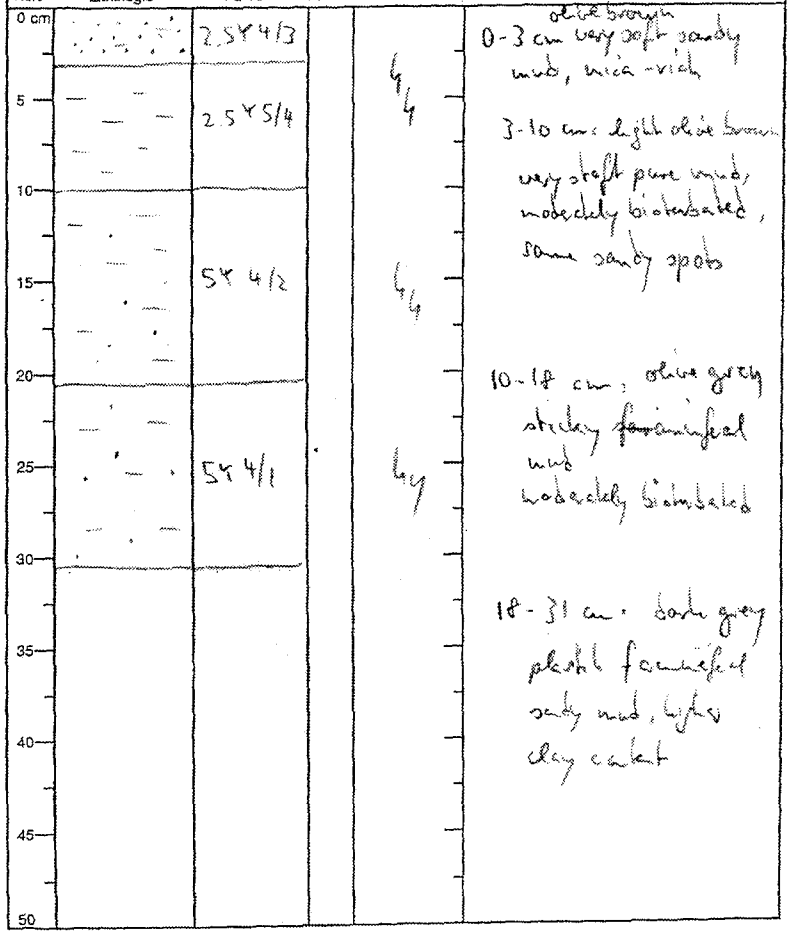
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB 11024-1**	Bearbeiter Hanebuth	Datum 27. Aug. 06

KERNBESCHREIBUNG

Eindringung (cm)	31 cm	Bemerkungen
Sediment - Temp. (° C)		



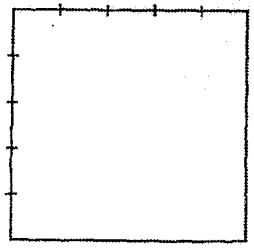
Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11025-1	Bearbeiter Schmidt	Datum 27.08.06

Bild 13, 14

BEPROBUNG

Eindringung (cm)	33	Bemerkungen
Sediment - Temp. (° C)	13,8	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

fine sand, greyish green, patchy (sand / brown) crabs, small worm tubes, irregular surface, shell frag.

no pcm water sample

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

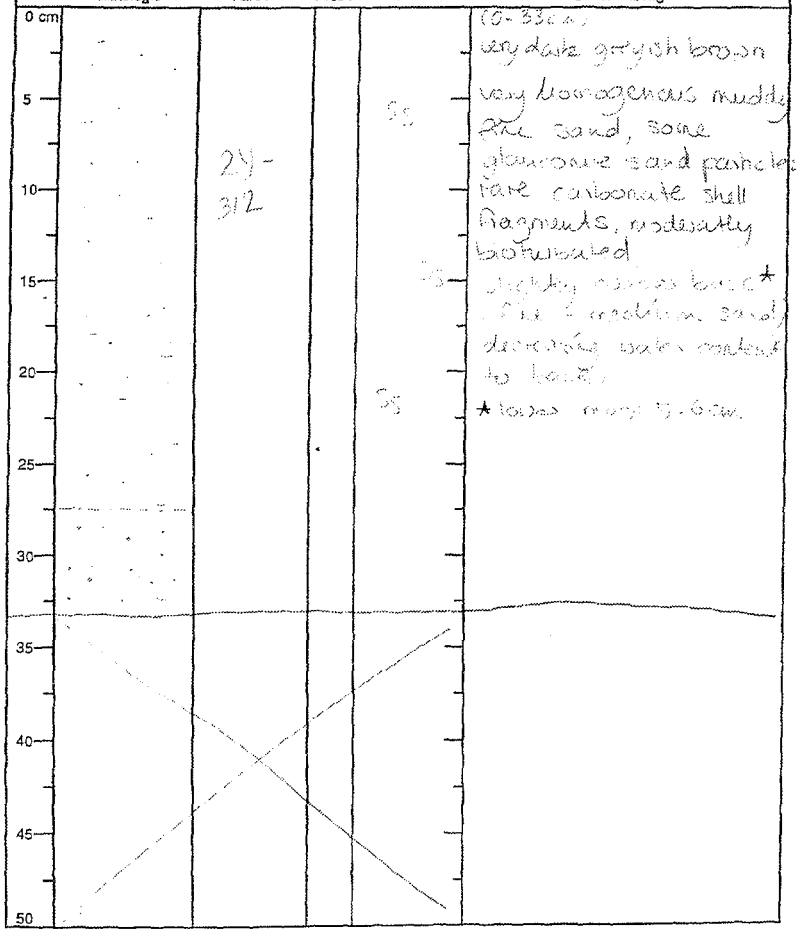
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11025-1	Bearbeiter Bender	Datum 30. Aug. 06

KERNBESCHREIBUNG

Eindringung (cm)	33 cm	Bemerkungen
Sediment - Temp. (° C)		



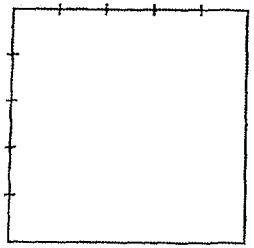
Reise 7342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11027-1	Schmidt	29.08.06

1/2

BEPROBUNG

Eindringung (cm)	290	Bemerkungen: surface partly destroyed
Sediment - Temp. (° C)	13.0	

Aufteilung der Oberfläche



Beschreibung der Oberfläche: silty fine sand, dark [illegible] grey
[illegible] surface fluffy layer
some worm holes, carbonate fragments
[illegible] and of black particles

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 -> cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11027-1	Bender	30 Aug 06

KERNBESCHREIBUNG

Eindringung (cm)	27 cm	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5Y 3/2			(15 - 27 cm) dark olive grey homogeneous muddy fine sand, abundant glauconite particles, some carbonate shell fragments (increasing content to base) (some mm in size) ~1 cm sized [illegible] shell fragment at 15 cm depth ~2 cm sized coarse shell fragment at 26 - 27 cm depth
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

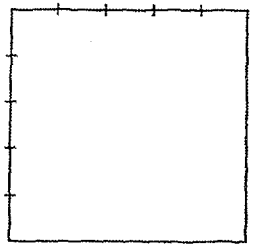
Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11028-1	Bearbeiter Schmidt	Datum 29.08.06

3,4

BEPROBUNG

Eindringung (cm)	44	Bemerkungen
Sediment - Temp. (°C)	12,3	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

silty fine sand mud, olive
very hard, worm burrows,
irregular surface, patchy layer
certain amount of black particles
mica

no pore water

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 -> cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

	GKG PROTOKOLL	
Stationsnummer **GeoB** 11028	Bearbeiter Schmidt	Datum 31.08.06

KERNBESCHREIBUNG

Eindringung (cm)	40	Bemerkungen
Sediment - Temp. (°C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5Y 4/2		5	silty mud shell fragments little mica content weakly bioturbated worm tube at 30-32 cm olive gray
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

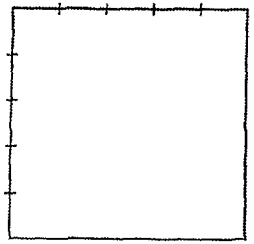
Reise P342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11029-1	Schmidt	29.08.06

3,67 8

BEPROBUNG

Eindringung (cm)	38	Bemerkungen
Sediment - Temp. (° C)	12,8	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

fine sandy mud, olive
ripples (1 cm low)
mica, black particles (manganese oxide?)
few shell carbonate fragments
crabs, a few burrows

no pore water

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11029-1	Schmidt	31.08.06

KERNBESCHREIBUNG

Eindringung (cm)	35	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm					silty mud
5				55	moderately bioturbated
					abundant mica
					few dispersed carbonate fragments
					organic enrichment at 20 cm & 47 cm
10					
15		2.5Y 4/3			olive brown
20					
25					
30					
35					
40					
45					
50					

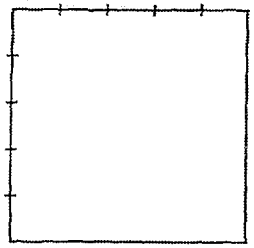
Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB 11030-1**	Bearbeiter Schmidt	Datum 29.08.06

3,10

BEPROBUNG

Eindringung (cm)	30	Bemerkungen
Sediment - Temp. (° C)	13,0	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

mud/fine sand, brownish colour
shells, carbonate fragments
Turmschnecken, worm tubes
thin plt layer, mica
a certain amount of black particles

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

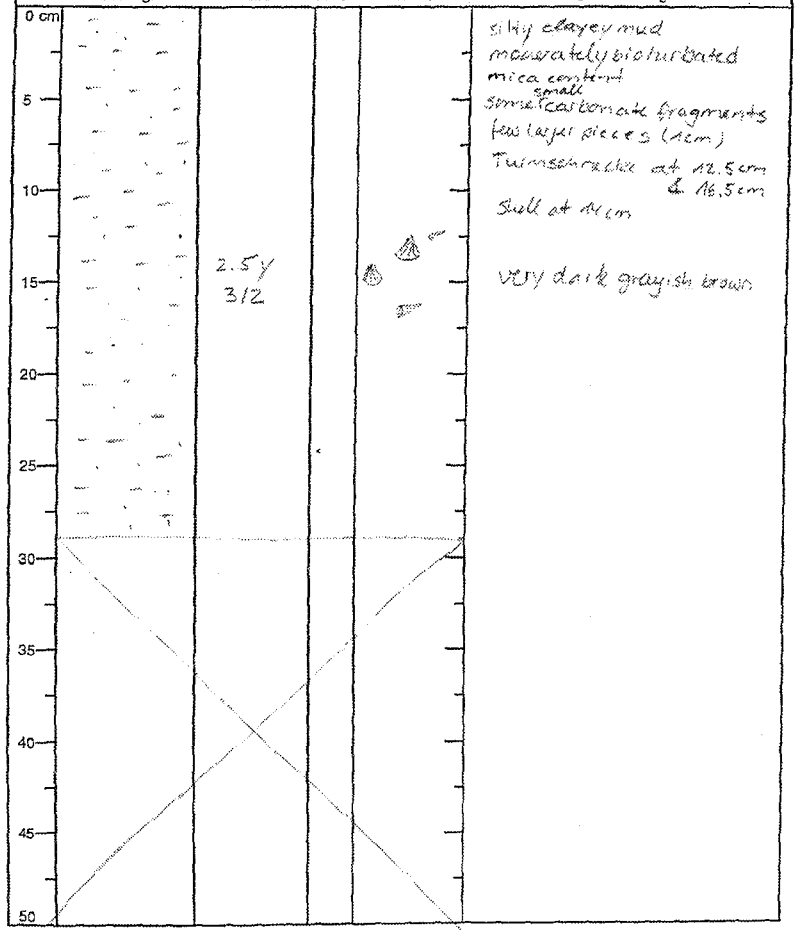
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB 11030-1**	Bearbeiter Schmidt	Datum 31.08.06

KERNBESCHREIBUNG

Eindringung (cm)	20	Bemerkungen
Sediment - Temp. (° C)		



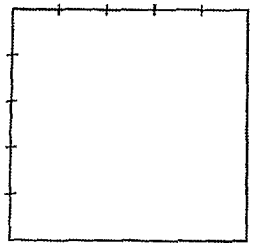
Reise P 342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11031-1	Schmidt	31 08 06

1, 2, 3

BEPROBUNG

Eindringung (cm)	21	Bemerkungen
Sediment - Temp. (° C)	13,1	

Auftellung der Oberfläche



Beschreibung der Oberfläche

[illegible]
irregular surface, some [illegible]
carbonate fragments
[illegible]

no pore water

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 -> cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11031-1	Lantzsch	04.03.2006

KERNBESCHREIBUNG

Eindringung (cm)	26	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		2,5Y 4/2		SS	dark grayish brown homogenous silty fine sand dispersed shell fragments (< 1 mm) increasing shell fragment content from 17 to 26 cm with some bivalve frags up to 3 mm medium bioturbation abundant glauconite
5					
10					
15				SS	
20					
25					
30					
35					
40					
45					
50					

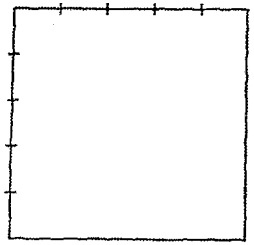
Reise P 342	GKG PROTOKOLL	
Stationsnummer **GeoB 11032-1**	Bearbeiter Schmidt	Datum 31.05.06

15-17

BEPROBUNG

Eindringung (cm)	26	Bemerkungen
Sediment - Temp. (° C)	11.0	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

olive gray fine to very fine sand, greenish gray irregular surface, some worm holes, some calcareous fragments

no pore water

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 -> cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB 11032-1**	Bearbeiter Hanebuth	Datum 04. Sept. 2006

KERNBESCHREIBUNG

Eindringung (cm)	20	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5/4 5			0-20 cm: olive gray fine to very fine sand, very homogenous, some small shell fragments and rare loose shells
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

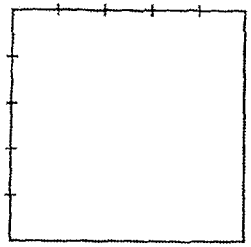
Reise P342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11033-1	Schmidt	31.08.06

Bild 54

BEPROBUNG

Eindringung (cm)	32cm	Bemerkungen
Sediment - Temp. (° C)	4.8°C	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

fine gravelly sand, clayey consistent
Rutschlager, brecciated
Pteropoda, Scaphopoda, worm tubes
Shells

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

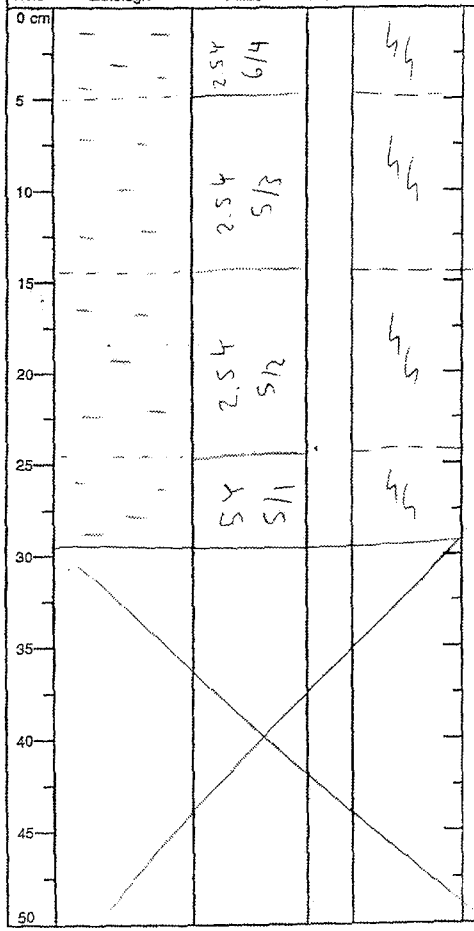
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11033-1	Homburk	04. Sept. 2006

KERNBESCHREIBUNG

Eindringung (cm)	29	Bemerkungen
Sediment - Temp. (° C)		



Beschreibung

foraminiferal mud, thoroughout
- uppermost 5 cm: very soft, light yellowish brown
- 5 - 14 cm: sticky, light olive brown
- 14 - 24 cm: sticky, greyish brown
- 24 - 29 cm: sticky, grey

typical deep sea bioturbation through the whole section

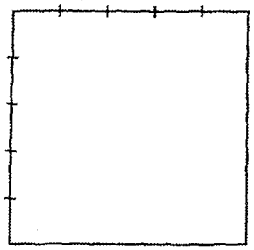
Reise P342	GKG PROTOKOLL	
Stationsnummer 6 GeoB 11036-1	Bearbeiter Schmidt	Datum 21.09.06

0-9

BEPROBUNG

Eindringung (cm)	22	Bemerkungen: surface partly destroyed
Sediment - Temp. (° C)	12,1°	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

gravel & coarse grained sand, brown, abundant shell fragments & shells, warm (should be) sandy, no smell, rounded

no pore water

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

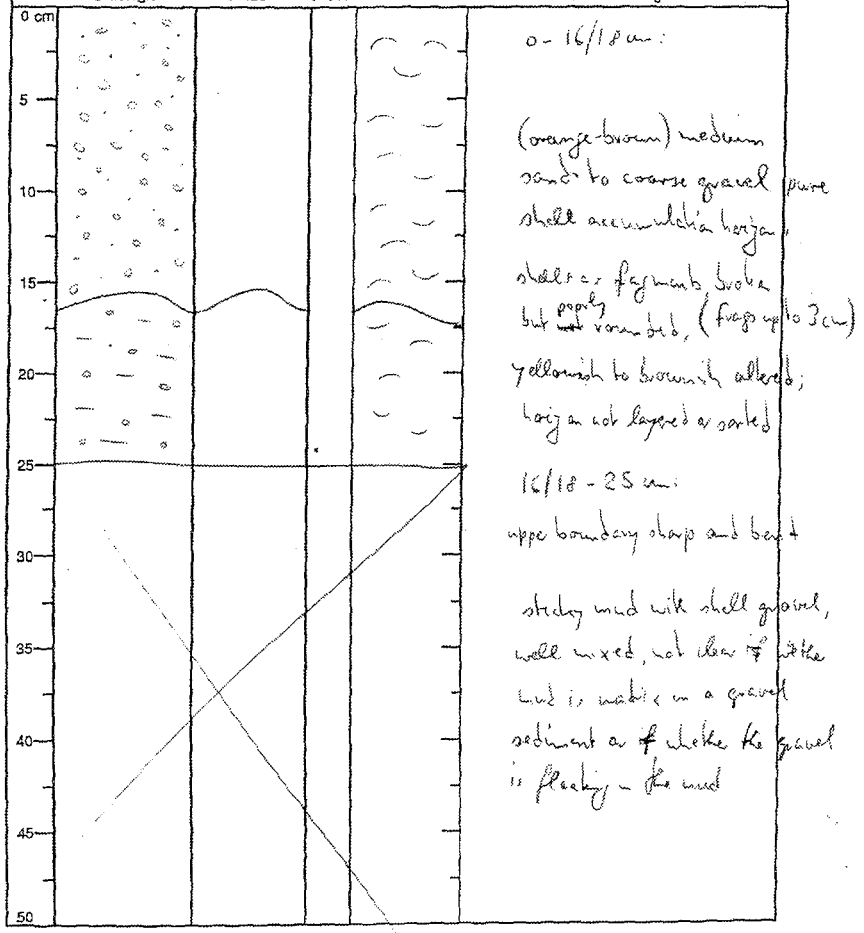
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer GeoB 11036-1	Bearbeiter Haneburk	Datum 04. Sept. 2006

KERNBESCHREIBUNG

Eindringung (cm)	25	Bemerkungen
Sediment - Temp. (° C)		



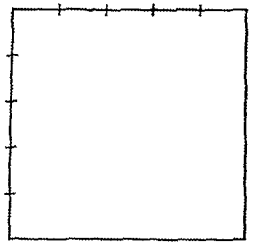
Reise P 342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11039-1	Bearbeiter Schmiedl	Datum 1.09.06

10-13 14-19

BEPROBUNG

Eindringung (cm)	18	Bemerkungen Surface partly disrupted by emptying water.
Sediment - Temp. (°C)	13.2	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

fine sandy to silty mud, olive
irregular surface, ~~dark~~
sand admixtures, carbonate fragments
minor content
(admixed ~~stones~~/gravel at the bottom)

no pore water

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

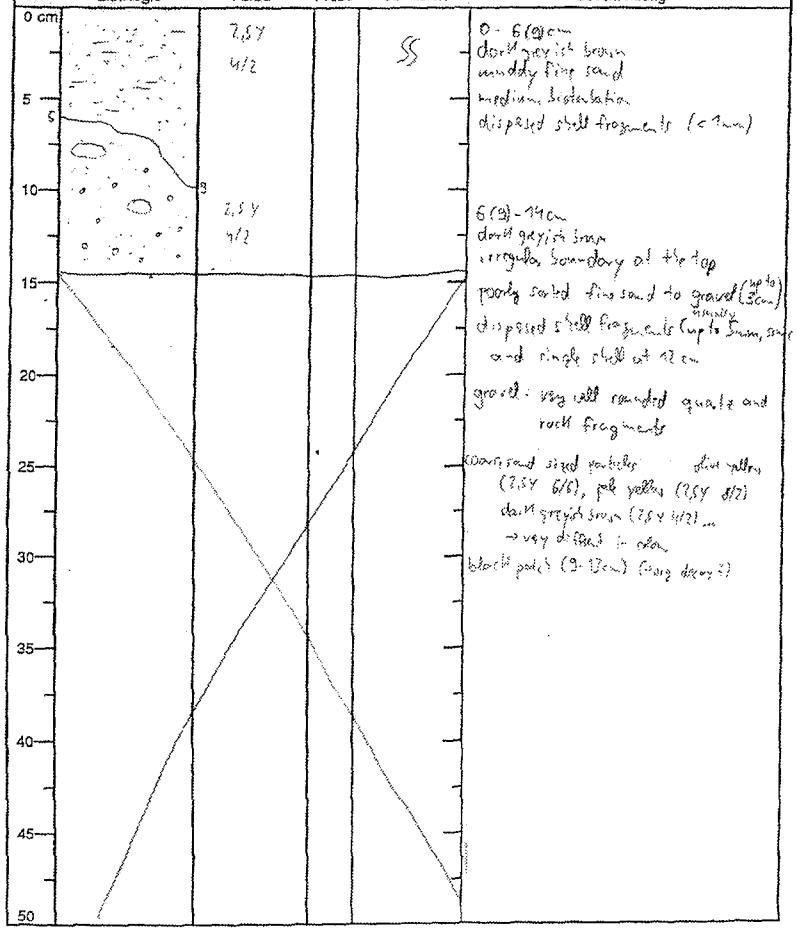
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11037-1	Bearbeiter Gerhardt	Datum 04.09.2006

KERNBESCHREIBUNG

Eindringung (cm)	14 cm	Bemerkungen Smells fishy
Sediment - Temp. (°C)		



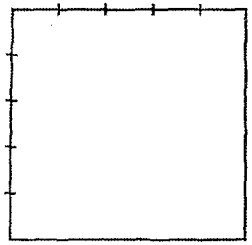
Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11038-1	Bearbeiter Schmiedl	Datum 1.09.06

20,21,22

BEPROBUNG

Eindringung (cm)	28cm	Bemerkungen
Sediment - Temp. (° C)	13,1	surface patchy oleaginous layer/coating Lunker

Aufteilung der Oberfläche



Beschreibung der Oberfläche

silty fine sand, brownish olive
abundant carbonate fragments
micas content, slightly irregular surface
a certain amount of black particles

no pore water

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

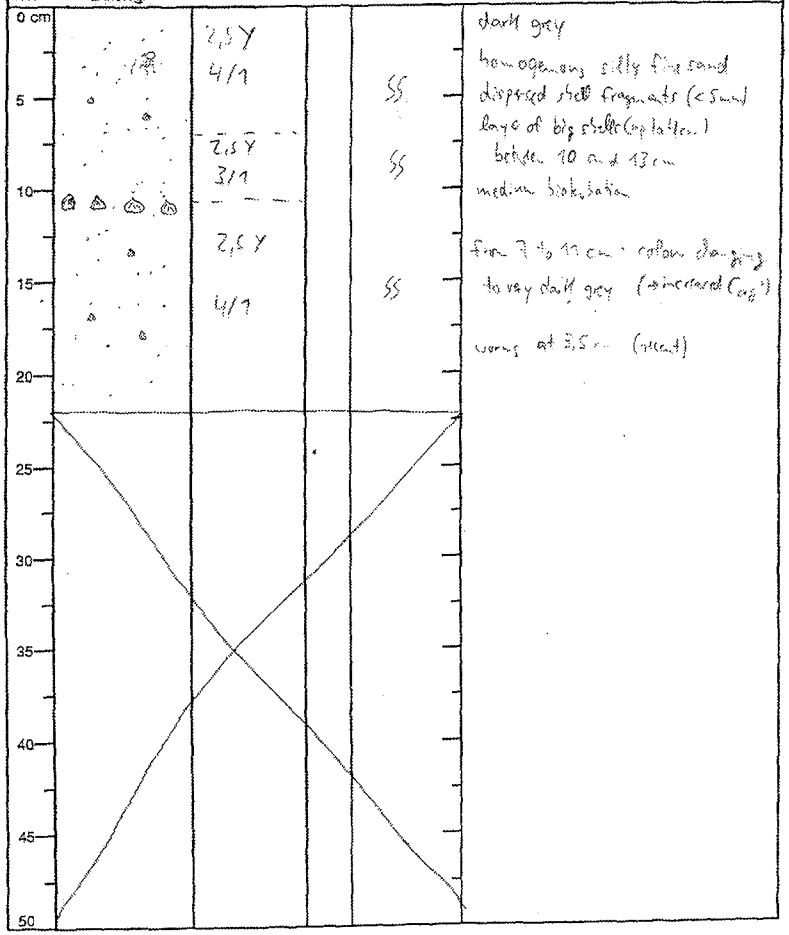
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11038-1	Bearbeiter Lantzsch	Datum 04.09.2006

KERNBESCHREIBUNG

Eindringung (cm)	22cm	Bemerkungen shelly silty
Sediment - Temp. (° C)		



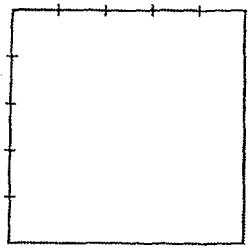
Reise 342	GKG PROTOKOLL	
Stationsnummer **GeoB** 342 11039-1	Bearbeiter Schmidt	Datum 1.09.06

24,25 32,33

BEPROBUNG

Eindringung (cm)	42	Bemerkungen
Sediment - Temp. (° C)	15.0	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

fine sandy mud olive
carbonate fragments of black pebbles
burrow (crab?)
irregular surface
small carbonate fragments
Turnstone (?)

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11039	Bearbeiter Schmidt	Datum 3.09.06

KERNBESCHREIBUNG

Eindringung (cm)	42	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		2.5 Y 4/3		S	fine sandy mud some small carbonate fragments weakly bioturbated olive brown
10		2.5 Y 3/3		SSS	strongly bioturbated sandy mud fine sandy patchy mud few carbonate fragments mud clast in the lower parts muddy fine sand horizon at 20 - 23 cm Turnstone at 9 cm very dark olive brown
25		2.5 Y 2.5/1			mud very homogenous moderately bioturbated (burrows olive) black
50					

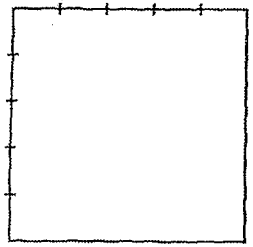
Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB 11040-1**	Bearbeiter Schmiedl	Datum 1.09.06

34 35, 36

BEPROBUNG

Eindringung (cm)	24	Bemerkungen: surface disrupted by overpenetrating water
Sediment - Temp. (° C)	13,2	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

silty fine sand, greenish olive
abundant carbonate fragments, shells
[illegible] coral, some more likely
with a century

no pore water

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB 11040 - 1**	Bearbeiter Haberkorn	Datum 04. Sept. 2006

KERNBESCHREIBUNG

Eindringung (cm)	22	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5Y 3/2			0 - 22 cm dark olive grey silty fine to medium sand, slight clay content increasing to the base, mm - size shell fragments throughout, single large (2 cm large) valves (bivalves at 5 & 20 cm) in total: 2 valves) some shell pebbles due to molecule and large- tube bioturbation
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

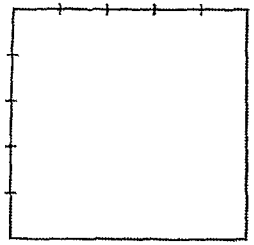
Reise P342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11041-1	Schmiedl	2.09.06

1-3

BEPROBUNG

Eindringung (cm)	33	Bemerkungen
Sediment - Temp. (° C)	12,5	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

muddy fine sand, gray, with small shell fragments and foraminifera, abundant, ... fine grained, ... bioturbated, ... weak ...

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

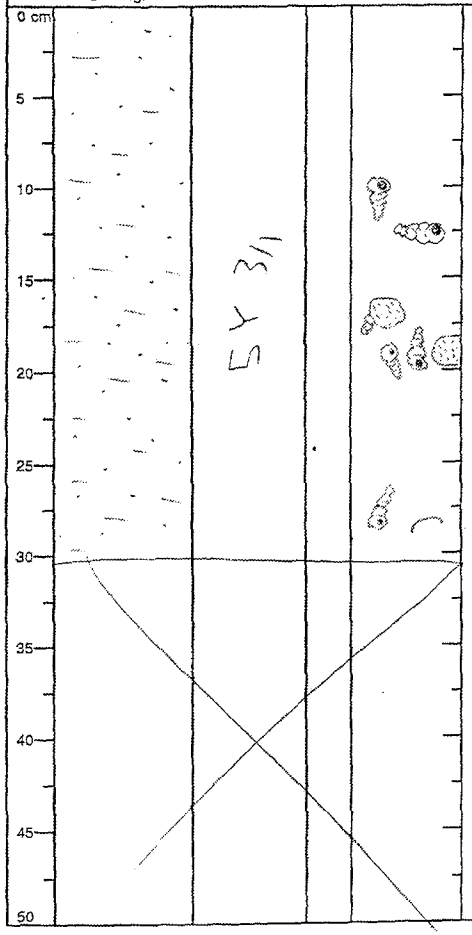
Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11041-1	Handwerk	04. Sept. 2006

KERNBESCHREIBUNG

Eindringung (cm)	31	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm					0 - 31 cm: very dark grey clayey fine sand, moderately bioturbated, dispersed small calcareous fragments, several 'Terebrachia' throughout the core; two burrows filled with a coarse-sandy mixing of shell debris and black minerals (glauconite?)
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					



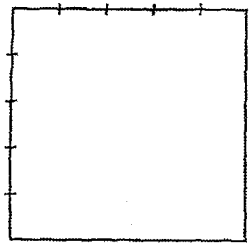
Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11042-1	Bearbeiter Schmidt	Datum 2.09.06

6,38

BEPROBUNG

Eindringung (cm)	36	Bemerkungen
Sediment - Temp. (° C)	13,0	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

Core mainly mud [illegible] grayish olive
[illegible] foraminifera, [illegible]
[illegible] (cm)
Turmschnecken
Crabs, [illegible]

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11042-1	Bearbeiter Haeckel	Datum 04. Sept 2006

KERNBESCHREIBUNG

Eindringung (cm)	34	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5Y 4/1			0 - 34 cm: dark grey muddy fine sand, with varying clay portion (stickyness), abundant small shell fragments and some single Turmschnecken throughout
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

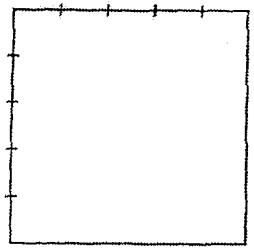
Reise P342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11043-1	Bearbeiter Schmiedl	Datum 2.09.06

13,14,15

BEPROBUNG

Eindringung (cm)	23	Bemerkungen
Sediment - Temp. (° C)	13,2	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

silty fine sand, olive
[illegible]
[illegible]
[illegible]
no core catcher sampling

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11043-1	Bearbeiter Hanebuth	Datum 04.Sept.2006

KERNBESCHREIBUNG

Eindringung (cm)	24	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5Y 4/1			0-15 cm: dark grey homogenous silty fine sand, numerous Turnichaeta (3 cm) and smaller shell debris
15		5Y 4/1			15-24 cm: dark grey same as above (silty fine sand) but no visible shell fragments certain content of mica
25					
30					
35					
40					
45					
50					

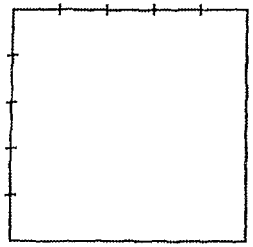
Reise P 342	GKG PROTOKOLL	
Stationsnummer **GeoB 11044-1**	Bearbeiter Schmiedl	Datum 3.09.06

28-31

BEPROBUNG

Eindringung (cm)	26	Bemerkungen
Sediment - Temp. (° C)	13,1	water only discharged by sub-pressure pump.

Auftellung der Oberfläche



Beschreibung der Oberfläche

fine sand, greenish olive, carbonate fragments, shells, ... Content of black particles ... sediment

no pore water sampling

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

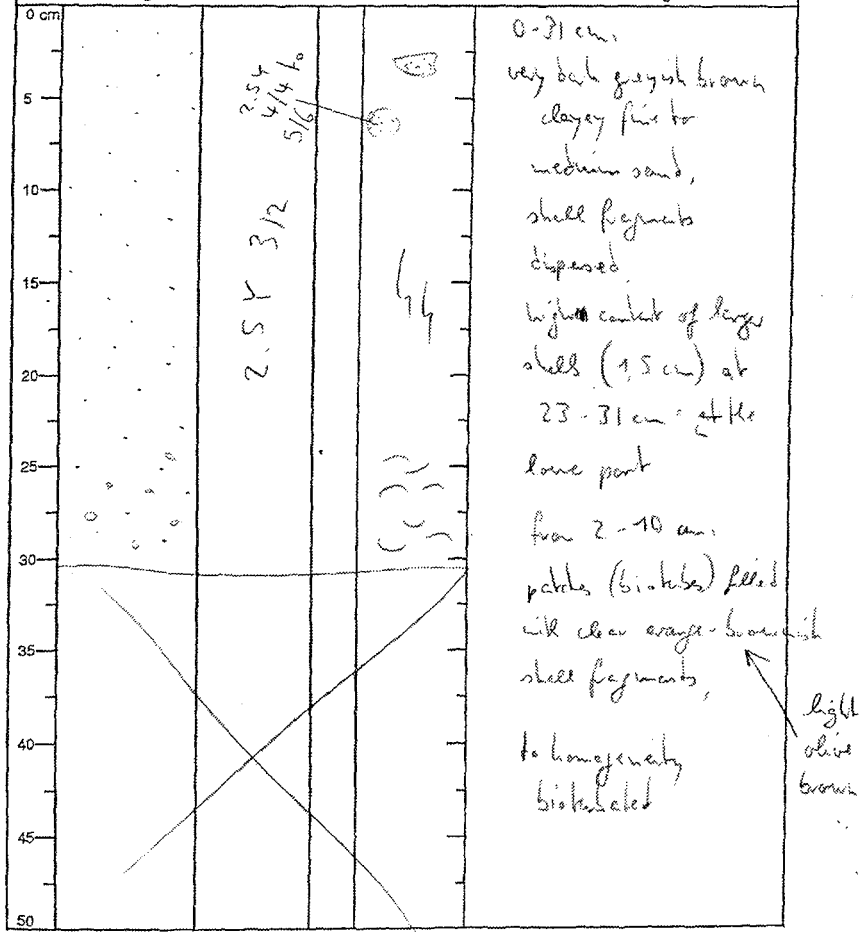
SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11044-1	Bearbeiter Hanebuth	Datum 04. Sept. 2006

KERNBESCHREIBUNG

Eindringung (cm)	31	Bemerkungen
Sediment - Temp. (° C)		



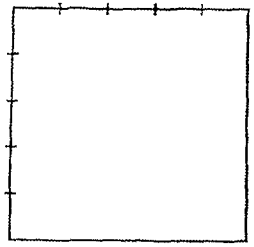
Reise P342	GKG PROTOKOLL	
Stationsnummer	Bearbeiter	Datum
GeoB 11045-1	Schmiedl	3.09.06

81, 82

BEPROBUNG

Eindringung (cm)	12	Bemerkungen
Sediment - Temp. (° C)	12.3	

Aufteilung der Oberfläche



Beschreibung der Oberfläche

sand, carbonate fragments

no [illegible] sampling

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer	Bearbeiter	Datum
GeoB 11045-1	(Lantzsch)	04.09.2006

KERNBESCHREIBUNG

Eindringung (cm)	12	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5Y 4/2			olive gray silty fine sand, homogenous dispersed shell fragm. (mm), increased number from ~ 7 to 12 cm (upto 5 mm ?) medium bioturbation color almost glauconite branch at 11.5 cm (1.5 x 4 mm)
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

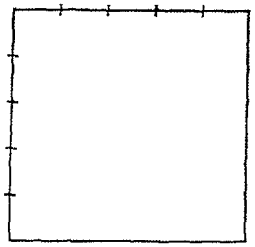
Reise P 342	GKG PROTOKOLL	
Stationsnummer **GeoB** 11046-1	Bearbeiter Schmidt	Datum 3.09.06

89

BEPROBUNG

Eindringung (cm)	20	Bemerkungen
Sediment - Temp. (° C)	13,1	surface disturbed by overpressure

Auflösung der Oberfläche



Beschreibung der Oberfläche

sand, greenish-olive
with shell fragments
and black minerals
(glauconite ?)

OBERFLÄCHEN - PROBEN (cm^2)

Foraminiferen (gefärbt)		Fauna (Spritze 10 ml)		
Foraminiferen		Ton - Minerale		
Radiolarien		Be - Tracer		
Diatomeen		Th - Tracer		
org. Kohlenst.				
magn. Bakterien				

LINER 12 cm (Länge / cm)

Archiv - Rohr	
Archiv - Rohr	
Geophysik - Rohr	
Geochemie - Rohr	

RÖNTGEN - PRÄPARATE

Röntgen - Präp.	Tiefe (cm) von	bis
RP 1		
RP 2		

FRAKTION > 1 mm

0 - 5 cm	
5 - 10 cm	
10 - 20 cm	
20 - > cm	

SPRITZENPROBEN

Tiefe (cm)	1	4	7	10	13	16	19	22	25	28	31	34	37	40	43	46	49
A - Serie																	
B - Serie																	
Smear - Slides																	

GKG PROTOKOLL		
Stationsnummer **GeoB** 11046-1	Bearbeiter Hanebuth	Datum 04. Sept. 2006

KERNBESCHREIBUNG

Eindringung (cm)	22	Bemerkungen
Sediment - Temp. (° C)		

Tiefe	Lithologie	Farbe	Probe	Strukturen	Beschreibung
0 cm		5 Y 3/2			0 - 22 cm: dark olive grey very homogenous slightly silty fine sand, few shell fragments and black mineral (glauconite ?) throughout, few layer valves, living worm at 2 cm a light orange/brownish layer like found at 20/21 cm

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